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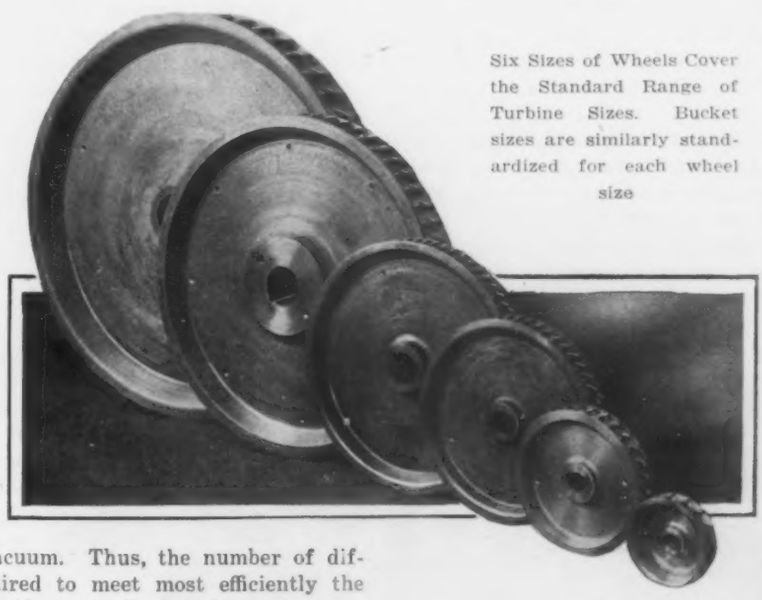
Making Engineering Product on a Factory Basis

Building Turbines with Consideration to Variations of Conditions of Use by Simplification and Standardization

Frame for Different Sized Wheels Are Designed to Allow Some Interchangeability of Parts

BY L. S. LOVE

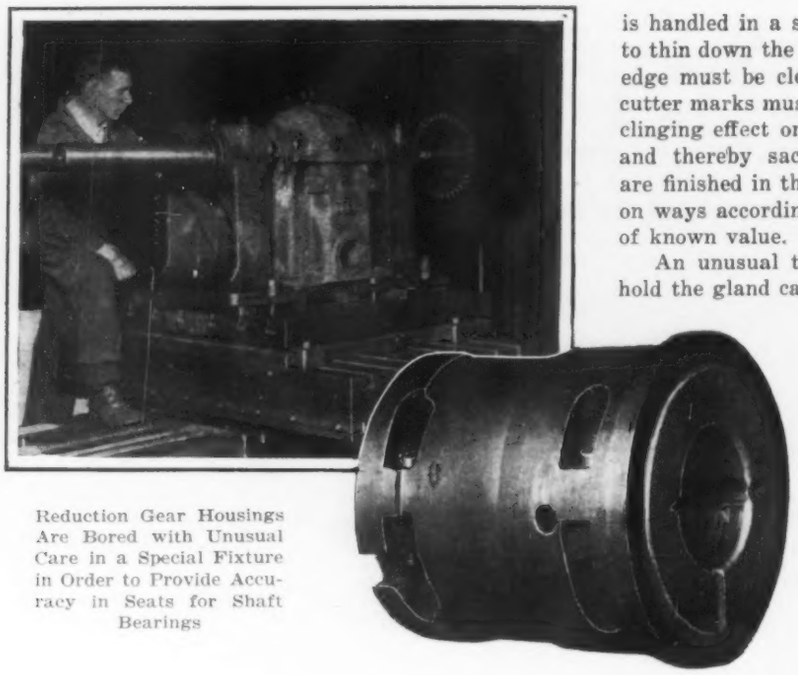
THE manufacture of steam turbines presents the difficulty that practically every sale involves an engineering job calling for special consideration. There is the horsepower, the speed, the steam pressure and the exhaust pressure, which must be considered. These variables in great variety give a myriad of possible combinations. Running speeds may vary from 500 to 5000 r.p.m., a change of 50 revolutions per minute being sufficient to cause a marked difference in the turbine characteristics. The problems of making an engineering product may be illustrated from the experience of the Terry Steam Turbine Co., Hartford, Conn., which builds turbines ranging in capacity from approximately 1 to 15,000 hp. The steam pressures encountered vary anywhere from atmospheric pressure, or approximately 15 lb. absolute, to over 300 lb., and the exhaust or back pressures, from 125 lb. down to 29 in. of vacuum. Thus, the number of different turbines required to meet most efficiently the various conditions could run easily into large figures.



Six Sizes of Wheels Cover the Standard Range of Turbine Sizes. Bucket sizes are similarly standardized for each wheel size

It would seem at first glance that the solution to the problem would be to design a series of frames in graded sizes from the minimum to the maximum capacity, but such is not the case, for two different size turbines might be required to develop the same power. One, operating at 80 lb. pressure, would require relatively large steam passages and valves. Another, operating under 300 lb. steam pressure, would require small steam passages and small valves. If the first were called on to operate at 500 r.p.m., it would require a large wheel to obtain a reasonable efficiency. The other, operating at higher speeds, would need only a small wheel, with a small shaft, small bearings, etc. Thus it becomes necessary to arrange parts in groups and to select sizes in each group, and thus so design the group assemblies that numbers of combinations of standard parts are possible. This method permits the production of standard parts in reasonably large quantities capable of assembly to meet closely all specified conditions.

In the illustration at the head of the article is shown two different frame sizes. That to the right takes an 18-in. wheel; that to the left, a 24-in. These two frames provide for the same sized bearings, the same glands and the same shafts. The one with the larger wheel is more suitable, of course, for slow speeds; the smaller wheel, for the higher speeds. The center distance between valve body and shaft is the same in the two cases, permitting the use of the identical governor and governor valve parts on both sides. Each of these frames will take two or more sizes of a standard line of valve bodies, and each valve body will accommodate two or more sizes of a standard line of internal valves, the complete range of valve sizes being sufficiently varied to accommodate the total range in capacity of the frames. Even with such standardization there are some 12,000 parts to be manufactured and stocked. Parts are made in as large lots as is practical, and those used in largest quantities are extensively tooled, to use a shop term, thereby reducing manufacturing costs.



Reduction Gear Housings Are Bored with Unusual Care in a Special Fixture in Order to Provide Accuracy in Seats for Shaft Bearings

Due to the conditions to be met, several interesting manufacturing methods have been developed. Owing to the fact that no plugs, which might be fitted to cored holes, will stand the testing pressure of 100 per cent above the operating pressure, much machine work must be done before the testing can be undertaken. For this reason castings are thoroughly cleaned, then checked to make sure they will finish, before any machining is started. In each case the foreman of the department conducts the preliminary inspection.

The standard Terry turbine uses one style, shape and size of bucket for each diameter of wheel, regardless of horsepower, speed, etc. There are six sizes in regular production, namely, 7 in., 12 in., 18 in., 24 in., 30 in., and 36 in. These wheels are made from a solid forging and after being turned all over, the buckets are cut in a Lincoln type milling machine, on the table of which is mounted an indexing rotating fixture, also here illustrated.

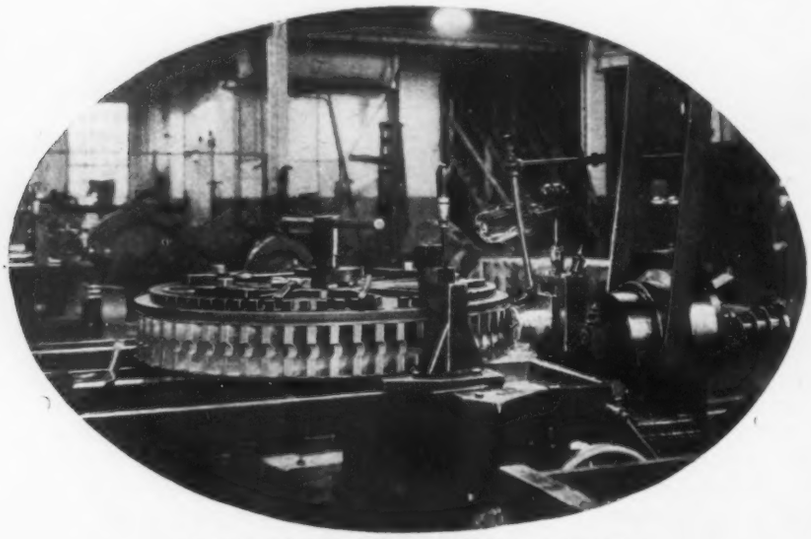
There are two cuts taken; the first gashes the buckets to depth and proper spacing. A locking device is mounted in a position convenient for the operator. This inserts a tapered pin in one after another of the holes in the index plate, the latter being bolted on top of, and securely attached to, the wheel in process. In this manner the first operation produces bucket slots properly spaced for the second operation. This latter is handled in a similar machine and fixture and serves to thin down the bucket edge. After this operation each edge must be cleaned and sharpened by hand, also all cutter marks must be removed, as these have a so-called clinging effect on the steam, causing it to roll on itself and thereby sacrificing efficiency. After the wheels are finished in the manner described, they are balanced on ways according to a pendulum system with weights of known value.

An unusual type of fixture has been developed to hold the gland casting while being machined. One pattern of casting is shown among the illustrations. It holds three carbon rings made up of three segments each. These rings are held together by a garter spring made of non-corrosive metal. It is bored out 0.001 in. small to permit it to wear down to a perfect bearing on the shaft. When it has worn sufficiently to permit steam leakage the segments can be removed, their radial ends faced slightly and replaced, thus making the gland again steam tight. The casting in which these carbon rings fit is finished inside, in the three grooves to hold the rings, and also outside on a surface which is fitted into the frame. The fixture in which this gland casting is held for machining is also shown. It consists of a main plate held in an ordinary scroll chuck. The lug on the casting containing the leak-off space fits between two blocks on the face of the fixture and serves as a driver for turning. A block, controlled by a tapered shoe or drift, is then brought against the other half of the gland casting, the two halves being bolted together and thus firmly holding the gland in place for machining.

The turbine employs a bronze reversing chamber having four pockets set at an angle. The steam enters a pocket in the wheel, is reversed through 180 deg. into the reversing chamber, where it is again reversed 180 deg. into the next bucket in the wheel, repeating the reversal there. This takes place four times before the steam is exhausted. These reversing chambers were formerly made in five parts carefully machined and fitted together. In order to save expense, and at the same time produce a steam-tight chamber, they are now being made of a single casting from a plaster of paris mold which is bound to give absolute uniformity and accurate size. The saving effected is over 80 per cent.

It sometimes proves that machine methods costly in themselves save money, an example of which occurs in the steel jet bodies which are required when the turbine is to operate under highly superheated steam. These bodies were formerly made of cast steel with two or three easily machined surfaces. They are now made out of solid cold rolled steel, which seems more primitive and costly but which has proved a money-saver because it eliminated a very large percentage of scrapped castings which had to be machined before they could be tested.

Nozzles of non-corrosive alloy are employed. The nozzles have a constant size of mouth for each diameter of wheel, the throat diameter varying to care for different steam conditions. Provision is also made for use of varying numbers



Buckets Are Milled from a Solid Forged Wheel

of nozzles, and it is also possible, due to the standardization features, to employ one large throated nozzle in conjunction with a number of smaller ones to take care of sudden special demands or changes in steam conditions.

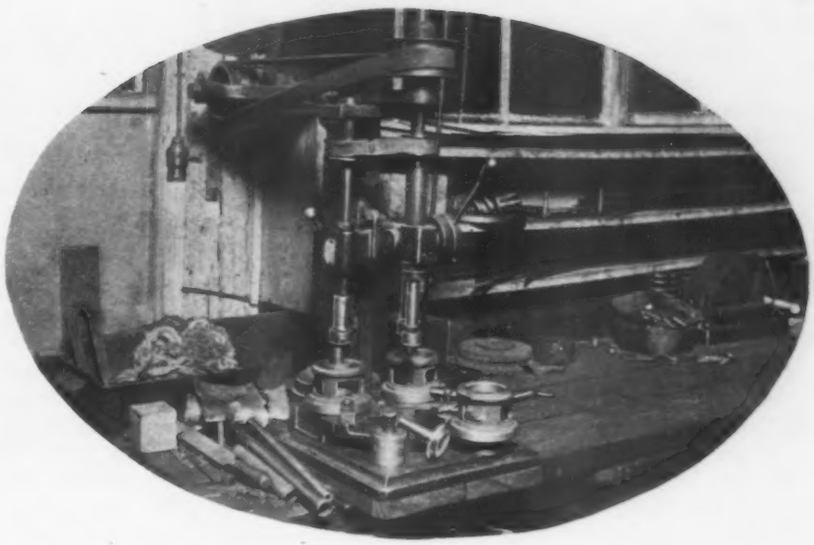
Several interesting features have been developed in the manufacture of the Rateau type of wheel. The slots are cut in a special machine, similar in appearance and indexing operation to the ordinary spur gear cutting machine. The cutter employed is a slitting saw of a width suitable to produce a slot sufficiently wide to accommodate the bucket and filler piece.

The buckets or blades are cut to length from rolled crescent shaped stock. One end is flattened in a press operation. This end is then finish trimmed and the other end is trimmed to provide the projection for riveting the shroud around the blades after insertion in the wheel. The blades are made of monel metal or other non-corrosive metal, depending on steam conditions; the filler piece is of Norway iron. This latter being rolled stock cut to length will vary in thickness to a slight degree. These pieces are graded according to thickness.

The wheel is set on a table having in it a vertical shaft and the blades are driven in by hand. Slight variations in thickness of the blade shanks are cared for by the graded filler pieces, which may be reduced in thickness a fraction of a thousandth, if further reduction is necessary, by rubbing the back on a strip of emery cloth. After the blades are all inserted, the wheel is mounted in a special swaging machine to lock the blades securely in place. This machine is an ordinary type of inclinable power press. In front of the press is a pair of guides, on which slide a pair of trunnion blocks, adjustable to or from the bed of the press, to accommodate wheels of different diameters. In these blocks rides a shaft carrying an index wheel having slots cut on the side, near the edge. These slots are not radial, thus permitting of adjustment by changing position horizontally of the locking pin which seats in them. Micrometer adjustment of the block holding this pin is therefore possible. This adjustment is necessary so that the swaging operation may be performed at exactly the right point. Otherwise there would be a tendency for chips to be broken off the filler pieces, preventing locking.

The shroud is made in one piece. To allow for stretch in punching holes, it is cut a little short and the holes punched, one at a time, registering from each successive hole. It is then fitted to the wheel around the inserted buckets and held in place by riveting the bucket ends in a rotary riveting machine. The wheel is then balanced on ways in a manner similar to the balancing of the Terry wheel.

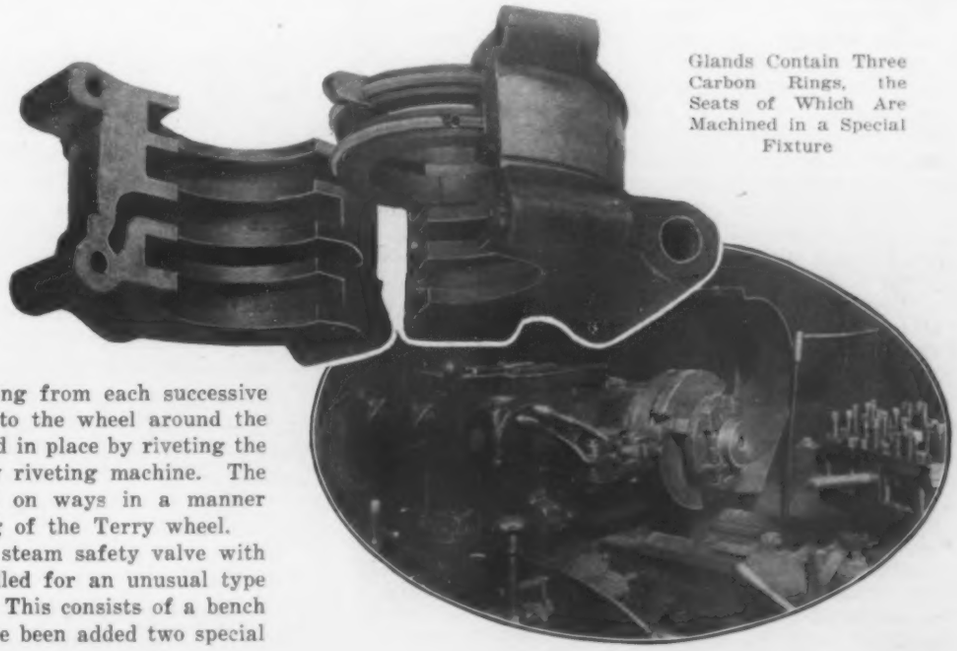
An unusual type of steam safety valve with a spherical seat has called for an unusual type of machine to grind it. This consists of a bench drill press, to which have been added two special spindles, one on each side of the regular spindle, the spindles taking the corners of a triangle. Valve cages are set on the table in holders provided for the purpose and the valves inserted. Weights are then placed on the valves over the shanks to add slight pressure, and the machine spindles, to which an eccentric driving pin is attached, are applied to the ends of the valve stems. The rotation of the spindles with their eccentric pins sets up a rocking motion in the valve so that each portion of the valve face moves laterally across the seat. The freak effect of this motion is that each point on the valve surface as it glides back and forth across the seat, slowly advances so that every point on the valve surface comes in contact with every point on the valve seat, producing a spherical fit.



Valves Are Ground into Their Seats in a Special Grinding Machine Serving to Produce a Perfect Spherical Seat

At this point it might be noted that the practice in this shop is to group machines of different types, so far as possible, into departments to produce certain work. Thus, in the making of valves, all types of machines needed in their production are in one department, even to the hydraulic testing machine, thus avoiding the shifting of responsibility from one foreman to another for faulty work.

In the manufacture of reduction gears the Terry company has developed some interesting methods. These gears, which are used in conjunction with tur-



Glands Contain Three Carbon Rings, the Seats of Which Are Machined in a Special Fixture

bines, must run under certain circumstances at very high speeds, therefore calling for excessive accuracy in their construction. To secure this accuracy, first of all, in the gear housing, the two shaft bearing seats are bored in a special boring fixture. This fixture, shown in one illustration, consists of a base with two vertical housings. In these housings are mounted two parallel boring bars which run in self-alining ball bearings. The bar is closely fitted in the inner races, with just sufficient clearance to permit it to be advanced by the feed to carry the boring tool through the work. The fixture is mounted on the table of a horizontal boring, drilling and milling machine. In it is placed a casing to be bored. The machine boring bar is first attached to one of the bars in the fixture and that bearing seat machined; the head of the machine is then traversed to the other bar in the fixture and the hole at that position is bored. These seats are slightly scraped to fit the bearings which carry the shaft journals, the shafts themselves running in the bearings without scraping.

The preparation of these bearings, also illustrated, is done in a rather unusual manner. They are split bearings lined with babbitt; they are bolted together, bored and reamed and placed on an arbor which enters the hole under hand pressure only, thereby avoiding any tendency to strain the bearing at the joints and throwing it out of round when the arbor is removed. The drive for turning is secured by means of a pin pushed through the bearing and arbor, the hole in the bearing later serving for the admission of oil. These bearings are made without any oil grooves, which on this kind of service are found to break up the oil film. Oil rings are also done away with, forced feed lubrication being supplied from an oil pump which is located well below the oil level in the reservoir, thereby avoiding the possibility of its losing its priming.

After the seats are fitted to the bearings, accurate arbors are placed in them and alinement checked with a surface plate resting upon paper of 0.00075 in. thickness on the arbors at points over the four bearings. The four pieces of paper must be equally tight, thus showing whether bearings are properly in line.

OUTPUT OF MACHINE TOOLS

Census Figures for 1921 Show a Heavy Falling Off from 1919 Production

WASHINGTON, Jan. 30.—In the year of greatest depression the machine-tool industry has ever known, 1921, the output of machine tools was valued at $67,769,000, a decrease of 68.1 per cent from 1919, when the total output was valued at $212,400,000. The figures for 1921 do not include establishments reporting products whose total value did not exceed $5,000.

Except for presses, all types of machine tools produced in the United States showed a falling off in value in 1921 as compared with 1919, according to returns of the Census Bureau on the basis of field work in the industry. The measure of the reduction is found in the total values reported for all machine tools, which amounted in 1919 to $212,400,158, while in 1921 the total was only $67,769,161, a decrease of 68.1 per cent. This reduction was particularly heavy in certain items. Thus, sensitive drilling machines fell off 88.5 per cent, plain cylindrical grinding machines, turret lathes, power feed milling machines, bending machines and planers all fell off between 80 and 87 per cent.

Decrease Shown by Tables

General results of the census are shown in two tables, Table I covering the general census statistics of number of establishments, number of people engaged in the industry, and the dollar representation of the principal features of the business. Table II shows in detail the different types of machines, both by number and by value, in the two years and indicates clearly the very great drop in production caused by the overproduction in machine tools during the war period and the few months following the armistice.

Of the 349 establishments reported in 1921 as having products valued at $5,000 or more, Ohio had 98, or more than a quarter of the total. The others were distributed as follows: 37 in Massachusetts, 29 in Connecticut, 28 in New York, 25 in Michigan, 24 in Pennsylvania, 23 in Illinois, 17 in Wisconsin, 15 in Indiana, 12 each in New Jersey and Rhode Island, 7 each in Missouri and Vermont, 6 in Kentucky, 3 in New Hampshire, 2 in Minnesota and one each in California, Delaware, Iowa and Maryland.

Considerable fluctuation is noted in the number of wage earners employed each month during 1921. In January, the month of maximum employment, 36,552 wage earners were reported, and in November, the month of minimum employment, 14,773 were employed—the minimum representing 40.4 per cent of the maximum. The average number employed during 1921 was 21,321, as compared with 53,111 in 1919, a decrease of 59.9 per cent.

Table I—Machine Tool Manufacturing

	1921	1919	Per cent of Decrease
Number of establishments	349	385	...
Persons engaged, average	25,990	61,762	57.9
Proprietors and firm members	119	132	9.8
Salaried employees	4,550	8,519	46.6
Wage earners	21,321	53,111	59.9
Salary and wage payments	$37,281,000	$84,217,000	55.7
Salaries	12,018,000	18,038,000	33.4
Wages	25,263,000	66,179,000	61.8
Contract Work	234,000	1,470,000	84.1
Cost of Materials	23,989,000	59,034,000	59.4
Value of Products	67,769,000	212,400,000	68.1
Value added by manufacture (Products less cost of materials)	43,780,000	153,366,000	71.5

Table II—Comparative Statistics of Machine Tool Production in 1919 and 1921.

	1921 Number	1921 Value	1919 Number	1919 Value	Per Cent of Decrease (Value)
Boring machines:					
Horizontal	632	1,340,106	826	4,437,937	69.8
Vertical	266	1,840,792	607	4,329,654	57.5
Total	*898*	*3,180,898*	*1,433*	*8,767,591*	*63.7*
Drilling machines:					
Multiple-spindle	676	1,106,097	1,440	1,998,594	44.7
Radial	2,243	1,548,058	2,732	5,702,134	72.9
Sensitive	1,154	226,801	5,993	1,974,917	88.5
Upright	1,493	593,956	6,477	1,754,463	66.1
Total	*5,566*	*3,474,912*	*16,642*	*11,430,108*	*69.6*
Grinding machines:					
Cylindrical					
Plain	2,022	1,841,701	8,359	12,011,923	84.7
Universal	1,105	480,584	1,792	2,066,166	76.7
All other	17,919	1,147,460	2,735	1,725,252	33.5
Total	*21,046*	*3,469,745*	*12,886*	*15,803,341*	*78.0*
Lathes:					
Engine	5,117	5,229,884	17,188	23,239,849	77.5
Turret	1,087	1,580,842	4,657	10,140,582	84.4
Bench and all other	1,063	1,872,928	7,186	4,094,346	54.3
Total	*7,267*	*8,683,654*	*29,031*	*37,474,777*	*76.8*
Milling machines:					
Power feed					
Plain	536	812,346	4,635	6,171,040	86.8
Universal	494	1,092,234	3,163	5,580,044	80.4
Vertical	212	415,275	1,304	2,755,943	84.9
Hand feed	468	233,945	....	*	...
All other	463	1,269,458	2,378	4,019,338	62.6
Total	*2,173*	*3,823,258*	*11,480*	*18,526,365*	*79.4*
Presses:					
Punching	20,045	7,284,166	32,168	5,400,044	34.9†
All other	3,783	1,643,244	3,618	956,855	71.7†
Total	*23,828*	*8,927,410*	*35,786*	*6,356,899*	*40.5†*
Bending machines	54	164,315	153	941,739	82.6
Broaching machines	530	616,933	549	1,395,300	55.8
Gear-cutting machines	840	1,736,667	2,688	5,845,565	70.3
Hammers, pneumatic and other	3,550	1,113,704	38,535	4,951,974	77.5
Planers	176	1,271,824	1,482	8,128,655	84.4
Pipe machines	1,192	570,509	4,118	2,481,441	77.0
Portable tools	....	4,411,409	....	10,907,928	59.6
Screw machines	2,661	2,839,667	6,227	9,625,046	70.5
Shapers	1,418	1,020,342	4,515	4,230,695	75.9
Shears	3,347	906,722	1,367	1,566,467	42.1
All other machine tools	....	5,362,711	....	31,313,335	82.9
Parts and attachments	....	8,936,547	....	‡	...
All other products	....	7,257,934	....	32,652,932	50.4
Total value		$67,769,161		$212,400,158	68.1

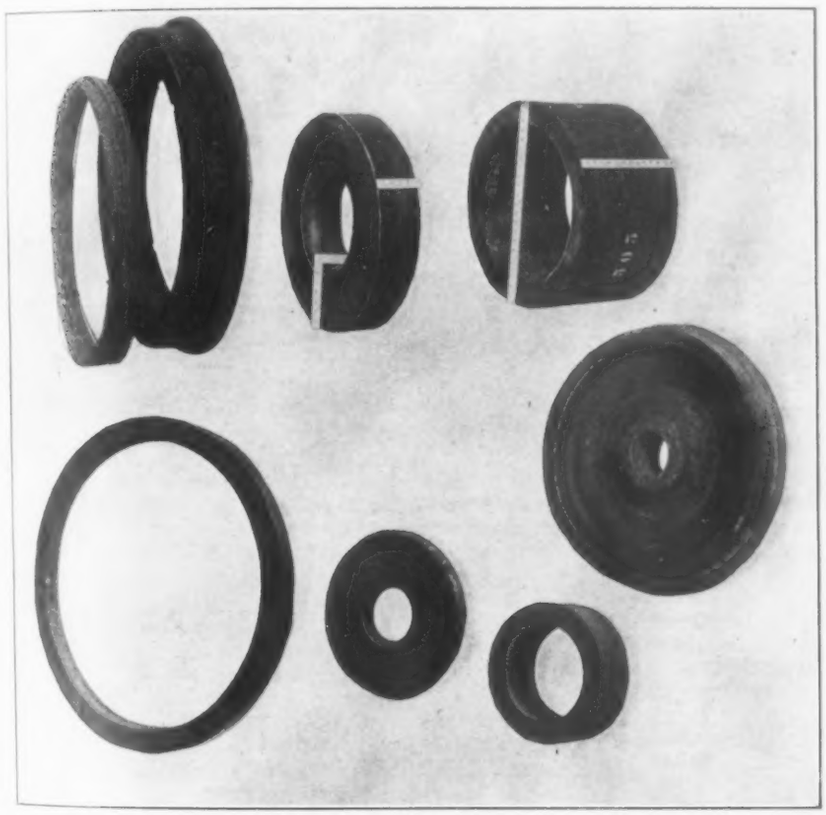
*Not reported separately in 1919.
†Denotes increase.
‡Included in "all other products" in 1919.

Special Products Made Centrifugally

Steel Disk Ingots for Tires, Wheels and Other Shapes Produced by McConway Process—Billets and Wire from Such Ingots

BY GEORGE F. TEGAN

ALTHOUGH almost three-quarters of a century has elapsed since the first patent was issued on a machine for centrifugally casting metals, it has remained for the past few years to develop contrivances of practical commercial value. Interest in the process has never lagged; instead, belief has been persistent that through it would be achieved castings of better quality than could be obtained by other methods. Experimentation has been constant and considerable success lately has been attained in centrifugal casting of



Some of the Successive Stages from Disks made by the McConway Machine to the Finished Products. The original ingot in the upper row was 13 in. wide and 22 in. in outside diameter with a wall thickness of 3 in. Pressed it assumed a wall thickness of 6 in. and a width of 5 in. with no change in outside diameter. Rings made from ingots are shown in the lower row; these can be transformed into billets. They are made in the special rolling mill. Steel carwheels are also a product

iron pipe, while the American Steel Foundries has employed this method in the manufacture of manganese car wheels. The manganese being of slightly greater specific gravity than the component metals, it has been found practical, by the whirling method of casting, to send that material closer to the outer or wearing edge of the wheel than is possible in other practice.

Until recently little success has attended the perfection of a machine or mold for casting ingots or sufficient size to compete profitably with current methods. William McConway, president McConway & Torley Co., Pittsburgh, who has been experimenting with the casting of steel ingots by the centrifugal process for some time, has perfected a machine for casting ingots in disk, tire or "doughnut" shape up to 1600 lb. in weight. His invention differs from others in that the centrifugal action is on a vertical instead of a horizontal plane. Steel of excellent structure has been produced and has many applications, not the least interesting of which has been its reduction to wire.

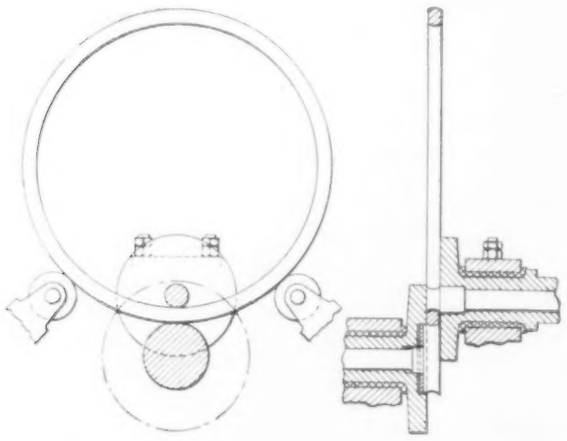
Quality considered, the cost is stated to compare favorably with the older and more common methods of ingot casting. It is claimed that for a yield of 100 lb. of commercial steel, it is rarely necessary to draw more than 105 lb. of metal from the ladle. The labor cost is low, as only two men are required in the operation of the machine beside the operator of the ladle crane and the man in charge of the hydraulic pressure.

As it is the purpose of the inventor to install a battery of the machines, a further reduction of the labor cost is expected in that the same crew should handle several machines. Casting action is rapid, taking only 20 to 22 min. per unit, measuring from discharge from ladle into matrix up to lodgement of resultant disk in the soaking pit (one-half the time so consumed is due to time for cooling), and power costs consequently are light.

The illustrations give details of the McConway casting machine. In operation, the only stationary parts are the bearings and the hydraulic nipple. The machine is motor driven and attains a peripheral speed of 65 ft. per sec. The process consists first in placing in position at the casting end the matrix, which determines the diameter of the disk or ingot. The fore plate, containing an aperture for the pouring spout, is then locked in place and the charging scaffold and scales are drawn into position.

In performance to date, it has been the practice to draw hot metal from the ladle into a smaller receptacle mounted on the charging scaffold, but when there is a

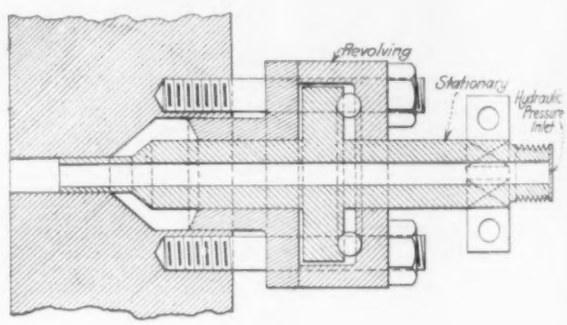
battery of machines in operation, direct casting from the ladle will be practiced. The cross section area of the disk or ingot is regulated by hydraulic pressure directed against the rear piston, connected by piston rod with the front piston. The pressure is introduced through a nipple with an aperture of 0.11 or 0.12 in.

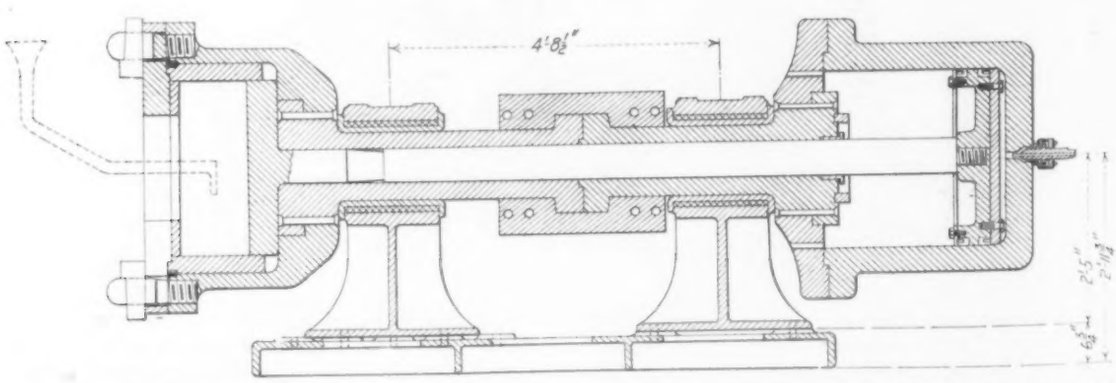


Plan of the Special Rolling Mill Employed to Reduce an Ingot to a Billet Or Ring Size. The ring is kept in position by guides or flanges on the drive

The steel disk, withdrawn from the molding machine, is removed to a soaking pit and, when evently heated, is pressed to the desired thickness and is ready for rolling. It seems a far cry from an ingot of small proportions to an 8-ft. ring, but this is possible through a rolling machine, the design of which is illustrated. The mill has a small inner roll and a large outer roll, both being curved at the periphery, with the drives equipped with guides for holding the ingot in alinement as the diameter of the ring increases. The ingot is introduced by drawing down the outer roll to a point where the piece to be rolled can be slipped onto the inner. One illustration shows the guides or supporting flanges set at 4 in. apart, and this is the set distance except when the mill is working on steel of greater width. It is a one-way mill and is the only one of its kind in this country. The inner roll is driven by a 500-hp. motor and the outer one by a motor of 1000 hp. capacity.

A ring 8 ft. in diameter can be produced which will yield six billets 4 x 4 in. in size and 4 ft. long. Rings for commercial uses frequently are of this size and locomotive tires furnish an example of current practice. The segments can be converted into straight billets by a single stroke of a bulldozer. The operation of the mill is identical with that of producing railroad tires. The disk lends itself readily, in the shape it comes from the matrix, to car wheels and gear blanks, wheels being possible without the usual broaching for the axle seat. Chemically, the steel produced is the same as cast in any other fashion; physically it is claimed to be of better structure and greater density than that cast in ordinary ingot mold form.





Details of the McConway Centrifugal Molding Machine. The plan of the hydraulic pressure inlet is also given. (Above)

Poor Railroad Service Causes Complaint in the Valleys

YOUNGSTOWN, Jan. 30.—An additional blast furnace in its Hubbard group, its last idle stack, is being operated this week by the Youngstown Sheet & Tube Co., bringing the number of active stacks in the Mahoning and Shenango Valleys to 33, of 47. Active capacity represents more than 80 per cent of the total, however, as all of the larger and more modern stacks are pouring. Of the active furnaces, 21 of 26 are in the Mahoning Valley and 12 of 20 are in the Shenango Valley. Of the total number, 13 are being operated by the Carnegie Steel Co., which has 15 blast furnaces in the two valleys. Both of its two idle units are older furnaces, and one of them at least, may never be relighted.

Complaints are being voiced by blast furnace interests with reference to transportation difficulties, which are cutting down shipments of coal and coke and interfering with normal supplies. At the Ohio Works of the Carnegie Steel Co., it has recently been necessary to bank a number of furnaces because of interruptions to coke shipments. Blast furnace operators depending upon coke shipments to maintain schedules declare transportation conditions are much less favorable than a month ago.

Steel production in the Mahoning Valley is averaging fully 90 per cent, but rolling mill expansion is retarded to some extent by lack of steel supplies. The Republic Iron & Steel Co. is preparing to blow in another blast furnace in this territory within a short time.

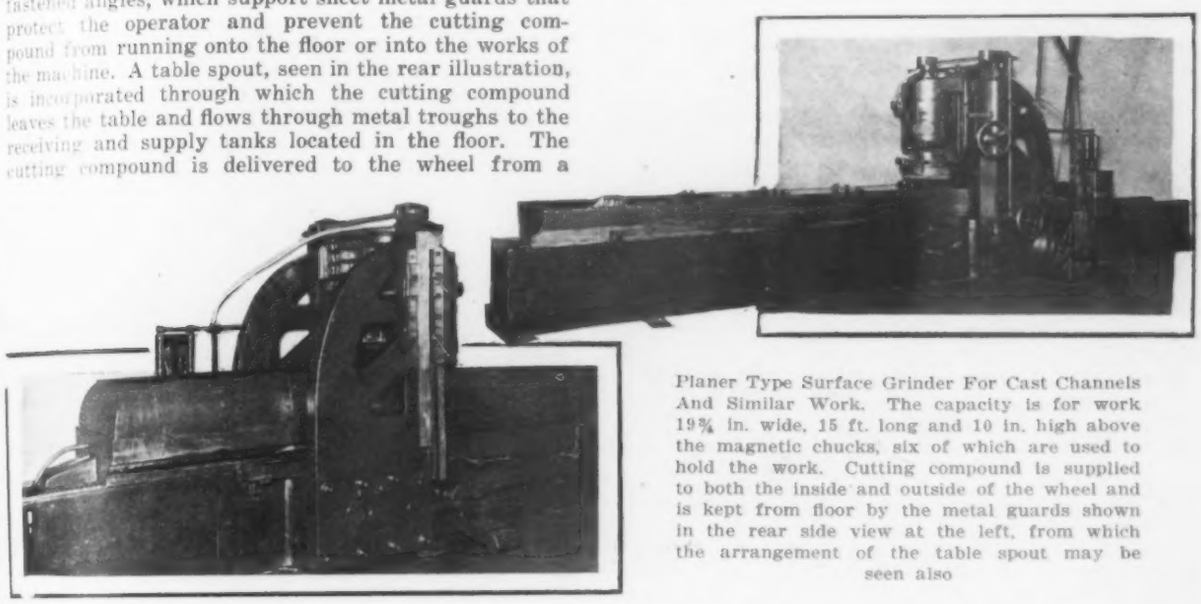
Owing to a reduction in the number of active sheet mills by the Trumbull Steel Co., Warren, but 97 mills are rolling this week, as compared with 104 last week. Semi-finished steel output is at a high rate, with three Bessemer converters blowing and 60 of 66 open-hearth furnaces charged. Strip steel manufacture is being carried forward at about 80 per cent. Skelp and tube production are close to normal. Independent tin plate output is close to 100 per cent.

Planer Type Surface Grinder

A planer type surface grinder designed primarily for the grinding of cast iron channels, but adaptable also to other classes of steel and cast iron work, has been placed on the market by the Reed-Prentice Co., Worcester. The capacity of the machine is for work 19¾ in. wide, 15 ft. long and 10 in. high above the magnetic chucks.

The machine is made up of the bed, table and housings of a 36 in. heavy duty planer, and a special cross rail on which a self-contained 25 hp. motor-driven grinder head carrying a 20 in. wheel is mounted. Vertical movement of the head is obtained through the handwheel shown at the front of the machine. The cross rail is raised and lowered by means of the lower handwheel, which is used only to properly position the wheel for different heights of work.

Around the entire length and width of the table are fastened angles, which support sheet metal guards that protect the operator and prevent the cutting compound from running onto the floor or into the works of the machine. A table spout, seen in the rear illustration, is incorporated through which the cutting compound leaves the table and flows through metal troughs to the receiving and supply tanks located in the floor. The cutting compound is delivered to the wheel from a pump in the supply tank, through two 1-in. pipes, one to the inside of the wheel and the other to the outside.



Planer Type Surface Grinder For Cast Channels And Similar Work. The capacity is for work 19¾ in. wide, 15 ft. long and 10 in. high above the magnetic chucks, six of which are used to hold the work. Cutting compound is supplied to both the inside and outside of the wheel and is kept from floor by the metal guards shown in the rear side view at the left, from which the arrangement of the table spout may be seen also

The work is held by six magnetic chucks which have a magnetic surface of 14⅛ x 19¾ in. and a cast iron spacer is placed between each chuck so that the work is supported the entire length against the thrust of the wheel. Side guides and spacers are mounted on the cast iron spacers, and at one end a work bunter is provided. These are necessary in case the electric current to the chucks should be shut off while the wheel is traveling over the work.

A two speed countershaft is provided for driving the table, the two speeds being for the roughing and finishing cuts, respectively. Roughing cuts are taken at a table speed of 30 ft. per min., and the wheel cuts on both the forward and return strokes. Finishing cuts are taken at a speed to suit the requirements.

Effect of Manganese on Steel

A method of preparing very pure iron has been developed at the Bureau of Standards and with this iron as a base various commercial steels and other iron alloys have been made for the purpose of testing them without the complicating effect of impurities which are usually present in commercial iron and steel. The use of manganese as a strengthening agent in addition to the carbon is the subject with which the investigation was chiefly concerned. Manganese is also used as a deoxidizer and as a desulphurizer, but these uses are better understood.

The use of higher percentages of manganese for producing high tensile properties in low and medium carbon steels has been recommended at times by various metallurgists and to some extent such recommendations have been carried out in commercial practice. The results obtained in this investigation of the structural effects of manganese in steel strongly confirm such recommendations.

The general effect of manganese may be concisely described as a "restraining influence" so that the pearlite or carbon-bearing constituent of steel, even after annealing, exists in a very fine grained condition if considerable manganese is present. In this respect the steel resembles in structure the condition which usually obtains in similar steels of low manganese content after rather rapid cooling, for example, air-cooling. The mechanical properties of the annealed high manganese steel are quite similar to those obtained in the lower manganese steel by cooling it more quickly. An additional effect of manganese upon steel is to shift the eutectoid composition to lower carbon contents by approximately 0.12 per cent for each per cent of manganese.

Manganese also appears to have a very noticeable effect upon the rate at which high carbon steels, such as carbon tool steels and file steels, assume the granular or "spheroidized" state—a condition which for many purposes is very desirable. Manganese exerts its characteristic retarding influence upon this change. This paper, "Preparation and Properties of Pure Iron Alloys, III. The Effect of Manganese on the Structure of Alloys of the Iron Carbon System," Scientific Paper No. 464 of the Bureau of Standards may be purchased from the superintendent of documents, Government Printing Office, Washington, at 10c. a copy.

Production of Titanium

Theoretically, titanium should be possible of production by several methods, including: Electrolysis of the oxide in a solution of dry halogen salts of the alkaline earth metals heated to moderate redness; reduction of the titanofluorides by the alkali metals; reduction of titanium dioxide with carbon, and reduction of titanium tetrachloride with sodium. However, the last is the only method that actually yields pure titanium, and the metal is so produced commercially today. Methods for the preparation of certain useful commercial titanium alloys are described in Serial 2406, which may be obtained from the Bureau of Mines, Washington.

The need of national codes relating to safety in the operation and maintenance of elevators and in building construction are the two principal subjects selected for the joint meeting of the engineering section of the National Safety Council and the American Society of Safety Engineers, to be held in the Engineering Societies Building, New York, Feb. 16. Elevator safety will be discussed at the morning session, and the national building code during the afternoon.

COMMISSION COMPLAINS

Formal Action Taken in Regard to Bethlehem-Lackawanna-Midvale Merger

WASHINGTON, Jan. 30.—Action of the Federal Trade Commission last Saturday in issuing a complaint against the merger of the Bethlehem Steel Co., the Lackawanna Co., and the Midvale Steel & Ordnance Co. had been discounted in the iron and steel industry in advance and therefore was accepted as a more or less formal proceeding. This view of the matter was taken because it was realized that the commission would have been inconsistent had it done otherwise. Having issued complaints against the now abandoned Midvale-Republic-Inland merger and the consummated merger of Bethlehem and Lackawanna, it was taken as a matter of course that a complaint would be issued against Bethlehem, Lackawanna and Midvale. It was issued in this form in order to consolidate these cases instead of proceeding separately under the former complaint against Bethlehem and Lackawanna, which was dismissed and the latest complaint substituted.

The present complaint is sweeping in character. It alleges that the union of Bethlehem, Lackawanna and Midvale would in the territory these interests serve, either substantially or wholly eliminate competition. Under this reasoning, the commission charges violation of Section 7 of the Clayton act. Then charging that it "has a dangerous tendency to hinder competition in the steel and iron industry," it is alleged it violates Section 5 of the Federal Trade Commission. Next, it is contended that the merger "is an unreasonable restriction upon competition amounting to restraint of trade, contrary to the public policy expressed in Section 1 and 3 of the Sherman act."

Taking the same position he did with regard to the Bethlehem-Lackawanna merger, Commissioner Van Fleet dissented to the issue of the pending complaint, to which answer is to be made in 30 days, after which the commission will fix a date of hearing.

Specifically the new complaint cites the Bethlehem Steel Corporation, Bethlehem Steel Co., Bethlehem Steel Bridge Corporation, Lackawanna Steel Co., Lackawanna Bridge Works Corporation, Midvale Steel & Ordnance Co., and Cambria Steel Co. It is declared that these groups represent an aggregate of 46 companies involved in the merger, the Bethlehem group being credited with 11 companies, the Lackawanna group 13 companies and the Midvale group, 22 companies. It is stated that these groups "operate more particularly in a competitive field embracing that territory north of the Potomac River and east of a line drawn north and south through Buffalo, and Johnstown, Pa.," and are the only iron and steel manufacturers in this territory with a capacity of 1,000,000 or more tons of steel ingots a year. Other steel producers in the territory named are declared to be relatively small, "no more than one of them having a capacity of 500,000 tons of steel ingots per year," and that while the merging interests are thoroughly integrated from raw to finished products, this is not true of the other companies in the territory mentioned.

President Grace's Statement

Referring to the opposing attitude of the Federal Trade Commission toward the merger of the Bethlehem, Lackawanna and the Midvale properties, President Eugene G. Grace of the Bethlehem Steel Corporation made the following statement Monday:

"The complaint of the Federal Trade Commission announced in Sunday's newspapers has not yet reached us. Such a complaint was, however, expected, and the news is no surprise to us. It will be remembered that when the Bethlehem-Lackawanna merger and the proposed Midvale-Republic-Inland merger were announced two investigations were instituted at the request of the United States Senate, one by the Department of Justice and the other by the Federal Trade Commission. The Department of Justice in its report to the Senate declared both transactions to be free from any taint of illegality. The Federal Trade Commission, however, felt bound to institute a formal proceeding to test the legality of the two mergers and filed complaints against each.

"Bethlehem proceeded with the acquisition of the Lackawanna properties, relying upon the report of the Attorney General and the advice of its counsel that the transaction was entirely legal. Before the public announcement of Bethlehem's proposed acquisition of the Midvale property, advance information was given, as courtesy required, both to the Department of Justice and to the Federal Trade Commission.

"The Federal Trade Commission, as was expected, advised us that, pursuant to the policy it had adopted, it would in the course amend the proceedings, already pending, to test the legality of the Bethlehem-Lackawanna merger so as to include Bethlehem's acquisition of the Midvale properties. The complaint now announced was accordingly fully expected."

MORE FREIGHT CARS

Surplus Shows Increase—Movement of Freight Cars Makes Record

WASHINGTON, Jan. 30.—Surplus freight cars of all descriptions and in good repair totaled 28,282 on Jan. 15, an increase since Jan. 7 of 7856, according to the Car Service Division of the American Railway Association. Surplus box cars numbered 7588, an increase within the same period of 897, while there was an increase in the number of surplus coal cars of 665, which brought the total to 6155. The shortage in box cars amounted to 28,283, a decrease of 2612, while the shortage in coal cars totaled 37,014, an increase of 2711.

While the figures show that industry still is faced with a car shortage, at the same time, it feels considerably reassured because of the performance of the railroads to overcome handicaps. These are reflected especially by the number of cars and locomotives installed and the greater efficiency in the movement of rolling stock.

The number of freight cars actually installed in service or ordered for future delivery from car builders during the calendar year 1922 exceeded the previous year by 76,117 cars. During the past year 145,553 freight cars were installed or on order, compared with 69,436 during 1921. Reports showed 77,221 freight cars actually placed in service in 1922 or 7784 more than were both ordered and installed the year before.

Freight car performance statistics, compiled for November by the Bureau of Railway Economics, shows that the daily average movement per freight car during that month was not only the greatest for any month in 1922, but also exceeded the average for November during the past six years. The average for the month was 27.1 miles, an increase of one-half a mile over the preceding month. It also exceeded by 2.1 miles the daily average for November, 1918, and by 3.8 miles the daily average for the same month in 1919, during both of which years the railroads were under Government operations. Each increase of one mile in the average movement of a freight car is equivalent to the addition of 100,000 freight cars to the country's transportation facilities, so that the gain for November over the previous month is equivalent to the addition of 50,000 cars.

A course on labor and employment management under the direction of J. D. Hackett has been announced by New York University to begin Feb. 4. The points to be covered include accident and fire prevention, management of a medical department, plant hygiene and sanitation, fatigue, lunch rooms and food for workers, wages and wage systems, employee representation, profit sharing and life insurance. The course is given under the direction of the department of business management of the university at Washington Square, New York.

Locomotive for Underground Work

An industrial locomotive in 3½ and 6-ton sizes, either with condensers or without, intended primarily for use in mines, tunnels and other underground work where smoke, gases and steam are objectionable, has been placed on the market by the Bloomsburg Locomotive Works, Bloomsburg, Pa.

The illustration shows one of the locomotives built for the City of Chicago, for tunnel work. A 30-hp. semi-flash type boiler is employed, fired with kerosene and using superheated steam with the company's standard 20 hp. engine. The engine has roller bearings and runs in an oil bath.

Smoke and gases are eliminated, it is claimed, by vaporizing the kerosene before burning. A feed water heater is incorporated in the condensing system for heating the water before it goes into the boiler, and the water level in the boiler is maintained automatically. The fire is controlled automatically and is cut off by a low-water mechanism should the water in the boiler become too low through failure of the feed water regulator to function. The automatic features are intended to make the locomotive fool proof. Rugged construction to withstand rough usage is emphasized and journal bearings are of the heavy duty Hyatt roller type.

Condensing Locomotive For Underground Work, Used By the City of Chicago. A 30-hp. semi-flash type boiler, fired with gasoline and using superheated steam, is employed, the engine being of 20 hp. and roller bearing throughout. Automatic control of water level and the fire are features

Where exhaust of steam is not objectionable, as in outside work, condensers may be eliminated, as the condenser feature adds to the cost of the locomotive. The fuel consumption is said to be between 10 and 15 gal. per day and the water consumption 40 to 50 gal.

Current Business Active

Preliminary figures of the Department of Commerce show exceptional activity for both December and the year. Among the outstanding items are a marked increase in receipts of foreign wool, heavy consumption of silk, higher pig iron production than any month since 1920, large output of coal and coke, very heavy car loadings and the largest volume of retail sales ever recorded.

Among the individual items listed, production of merchant pig iron is given as 428,000 tons in December against 386,000 tons in November, and 240,000 tons in December, 1921. Sales of merchant pig iron are given as 807,000 tons in December, being more than three times the 236,000 tons in November and almost four times the 210,000 tons of December, 1921. Production of zinc is placed at 42,841 net tons, compared with 40,200 tons in November and with 22,013 tons in December, 1921. Receipts of lead at St. Louis are placed at 6903 net tons in December, compared with 6627 tons in November, and with 7003 tons in December last year.

Unfilled orders for locomotives decreased slightly during the month, being placed now at 1592 compared with 1619 a month ago, and with 265 a year ago. Shipments during the month were 210, compared with 159 in November and with 89 in December, 1921. The volume of building remains at index 111, an unusually high figure for December. It compares with 122 in November. This is partially offset by exceptionally heavy fire losses, estimated for December at $47,426,000, compared with $30,776,000 in November, and at $28,908,000 in December of last year.

Combustion of Sawdust

The burning of sawdust for boiler purposes is best accomplished by means of a simply constructed Dutch-oven furnace, according to the United States Bureau of Mines. As a rule only one feed hole in the roof of the furnace is used, for sawdust is such an excellent fuel that it will produce a hot fire even when handled roughly and carelessly. Of course, with a single feeding hole in the top of the Dutch oven, the sawdust forms a cone on the grate surface. A cone is about the least effective form in which any fuel may be arranged on a grate for burning. The draft penetrates the bed of fuel at the points of least resistance, that is, at the shallowest parts; hence the air enters at an excessive rate around the edges of the cone while the largest part of the grate is effectually airtight and consequently is dead. This difficulty can be reduced or eliminated by different methods, which are described in technical paper No. 279 issued by the bureau.

Large Blast Furnace in India

What is reported to be the largest blast furnace in Asia was started recently at the Hirapur works of the Indian Iron & Steel Co., Ltd., Asansol. G. H. Fairhurst (managing director of the company) states that the furnace was designed to turn out 400 tons of pig iron per day. To reach this output a total of 1600 tons of material and products would have to be handled daily. It was also stated that the company's first by-product coking plant was now operating successfully, involving the daily handling of a further 1800 tons of material and products, and that in the first few months of 1923 the capacity figures would be doubled with the putting into operation of the second coke oven battery and the second blast furnace.

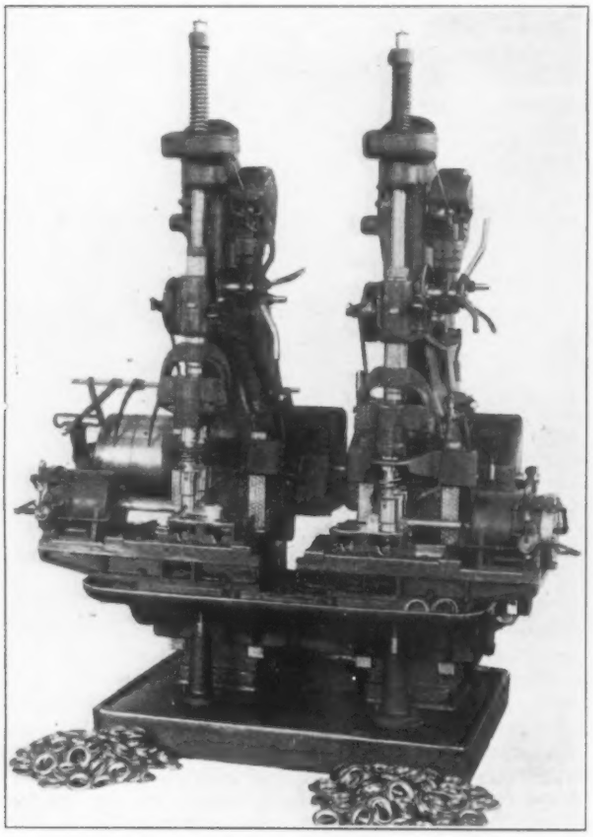
The Connellsville *Courier* estimates the production of beehive oven coke in the Connellsville district for 1922 at 5,666,500 net tons, as against 3,592,417 tons in 1921. At the end of 1922 it noted a total of 35,042 ovens standing, as compared with 35,473 at the end of 1921.

High Production in Tapping Steel Spuds

A machine especially adapted to the tapping of the pressed steel spuds used on steel barrels, and for which a production of 700 pieces per hour per operator is claimed, is shown the accompanying illustration.

A two-spindle, heavy-duty, all-geared gang drill of the Barnes Drill Co., Rockford, Ill., is employed, and is fitted with special geared thread leading feeds corresponding to the pitch of the taps used. The spindles are provided with coil springs for returning them automatically and instantly upon the tripping of the collapsing taps. Each spindle is provided with a two-spindle auxiliary head carrying two Rickert-Shafer collapsing taps of 2 in. pipe size.

Two air-operated two-position jigs are mounted on the table as shown, and while the two pieces are being



Heavy Duty Drill For Tapping Pressed Steel Spuds. The production is 700 pieces per hour

tapped simultaneously, the operator reloads the spare positions. Brackets are provided for resetting the chasers on the upward thrust of the spindle, as it is returned by the coil spring at the top. Small coil springs just above the taps serve to absorb the shock at the moment of resetting.

The machine itself is a heavy-duty manufacturing unit, and is equipped with a self-oiling system, all bearings aside from the spindle sleeves and cross spindles being continuously and automatically lubricated. All transmission gears, except the friction clutch gears, including the crown gear and pinion, are cut from chrome nickel steel, heat treated and tempered. There are eight changes of speed for each spindle. When fitted with 1 to 1 crown gearing for drilling work, and with a drive pulley speed of 500 r.p.m., the speeds range from 58 to 575, and with crown gears in ratio of 2 to 1, for tapping, the speed range is from 28 to 280. There are 10 changes of geared feeds from 0.003 to 0.093 in. per revolution of the spindle. These are controlled by levers in front of the operator, and the feeds are indicated on an index dial plate.

For tapping, the spindles may be equipped with the company's automatic reversing mechanism, in which a trip can be set so that when the tap reaches the depth required, the spindle will automatically reverse. The shifting lever can also be set so that when tripped automatically, or by hand, it will return to neutral position, stopping the spindle instantly instead of reversing it. A plain hand reverse lever is available if required.

A 10 hp. 1200 r.p.m. motor is recommended for the two-spindle machine. The distance from the center of the spindle to the face of the column is 11 in., and the distance center to center of spindles is 28 in. The maximum distance from the table to the nose of the spindle, No. 4 taper, is 32¾ in. The spindle travel is 14 in. and vertical travel of table 23 in. The floor space on the two spindle machine is 55x76 in. and height 85½ in. The table of the two-spindle machine is 14x47½ in., and maximum distance from top of table to floor, 42 in.

Extensions of Plant of Electric Steel & Forge Co.

Some extensions will be made to the plant formerly owned by the Electric Steel & Forge Co., Cleveland, which has been taken over by the newly organized Hunter Crucible Steel Co., as announced last week. A 30-pot crucible furnace will be added, some changes will be made to the mills, mainly in the design of the rolls, a new shipping room, 60 x 100 ft., is being built, and a cleaning room will be provided which will be equipped with a number of grinding machines.

It is announced that the new owners purchased the plant for $600,000, or about one-half of the appraised valuation. Bonds to the extent of $600,000 have been issued to pay for the property. The financing of the new company provides for an issue of $500,000 in debenture notes, $500,000 in preferred stock, and 125,000 shares of no-par common stock. Of the debentures $300,000 are being issued to provide working capital and $150,000 worth of preferred stock and the common stock will be issued at once.

In addition to the personnel of the new organization announced last week, Frank P. Case, formerly sales manager of the Braeburn Steel Co., and recently with the Atlas Crucible Steel Co., Dunkirk, N. Y., will be Western sales agent; L. M. Brown, formerly district sales manager of the Atlas Co. in the Cleveland and Pittsburgh districts, will be Eastern sales agent, and Shirley G. Ellis, formerly in the production and sales department of the Carnegie Steel Co., and later New York district manager for the Atlas Co., will be assistant sales agent.

Proposed Industrial Railroad

YOUNGSTOWN, Jan. 27.—Cooperation of independent iron and steel producers in the Mahoning Valley is being sought in an informal way in the plan to establish an industrial railroad to the Ohio River, to secure cheaper coal transportation. It is unlikely, however, that anything definite will be done until the absorption of the Brier Hill Steel Co. and the Steel & Tube Co. of America, by the Youngstown Sheet & Tube Co., is worked out. Sentiment among industrial executives is ripe for the project.

A substantial saving in assembly charges would be effected by the establishment of such a carrier, its proponents contend. Figures recently compiled show an estimated saving of $2.67 per ton of finished steel, compared with current assembly costs.

Two routes for the proposed line to follow are being discussed. One is via the Youngstown & Suburban and the Youngstown & Ohio River railroads, connecting with East Liverpool via Leetonia.

The other is the Ohio & Pennsylvania Belt Line Railroad, fostered several years ago by the Ohio Iron & Steel Co., under direction of its president, Robert Bentley, also a director of the Sheet & Tube company. This company controls certain right-of-way between Lowellville and East Youngstown in Ohio. Its nearest point to the Ohio River is 38 miles, passing through a country which presents no great obstacles toward the construction of a railroad.

Various estimates are set forth as to the cost of such a road, ranging from $10,000,000 to $12,000,000. By cooperating in the movement, independent interests in the Valleys declare the plan promises such a substantial saving in assembly costs that it cannot be neglected.

COAL PROBLEMS DISCUSSED

Southern Ohio Pig Iron and Coke Association Meets at Ironton

The annual meeting of the Southern Ohio Pig Iron and Coke Association was held at Ironton, Ohio, Jan. 24. The primary object was to get the views of the members on the coal question, with the idea of presenting the case of the steel and furnace operators, having their own coal mines, coke plants and cars, before the Fact-Finding Commission. After a lengthy discussion, it was felt that little could be gained by this movement, and the discussion reverted to how best to insure a regular supply of good quality coal for coking and other purposes.

President R. H. Sweetser gave a brief outline on some of the experiments conducted by the Bureau of Mines at blast furnaces of member companies, stating that the findings of the bureau would be published shortly. The committee on sampling and analysis reported that an inspector of sampling will be engaged at Cleveland as well as Toledo this year, and that member companies using this service were well satisfied with the results. It is probable that all the members of the association will use the services of the inspectors this year, as they will all have cargoes brought down from the head of the lakes.

The committee also recommended a careful survey of the Ohio River route to insure a constant stream of coal to consuming points. Many of the member plants included in the association's roster are located on the Ohio River, and it was felt that it could be used advantageously in keeping up the supply. One of the companies has erected a coal unloading plant costing nearly $1,000,000, which is operating satisfctorily. Since its completion, this plant has never been faced with a shortage of steam and gas producer coal, but nothing has been attempted in the way of bringing by-product coal by river to coke plants. The committee was also in favor of the intermediate storage of coal where this was possible, but it emphasized the point that this storage must be made, either at destination or intermediate points between mines and consuming plants, where its movement would be absolutely independent of orders of the Interstate Commerce Commission.

Mr. Cushing's Suggestions

George H. Cushing, Washington, addressing the meeting, said the productive capacity of the country today is 25,000,000 tons per week, and over-development will continue. There are now approximately 15,000 mines producing coal, where 4500 working full time could produce sufficient coal to take care of the consumption. In five years there will be 20,000 mines operating, and he believed that a coal operator would be fortunate in securing a 25 per cent car supply, as there was little chance of transportation conditions catching up with development of mines. This will bring about a sellers' market, and he looked for the time in the near future when commercial mines will withdraw their output from the contract market and sell on the open market.

Mr. Cushing believed the members of the association could work out a solution of their problems. They should depend on their own sources of supply and work out means of transportation. He believed it could be done, but was not in a position to make definite recommendations. They should make a careful study of their coal requirements, both as to quality and tonnage, the location of consuming plants and mines, and plans for storage. Without this information he would not advise going to the Interstate Commerce Commission for relief.

Sampling and Analysis

A paper on sampling and analysis of coal was read at the evening session, describing the method of sampling coal in vogue at the Portsmouth By-Product Coke Co. The paper stated that coal containing ash as high as 18 per cent had been received at the plant in recent months, which, of course, had been rejected. Coal running 10 per cent in ash and under 1 per cent in sulphur had been used, with varying results.

The association will add a committee on refractories to its list. E. M. Weinfurtner, chairman of the Refractories' Association committee on blast furnace and stove linings, addressed the association on what the refractories manufacturers are endeavoring to accomplish in the way of improving their product. The association will cooperate fully with the refractory manufacturers in furnishing any information desired.

The annual dinner was held at the Marting Hotel. Trade conditions were discussed, the consensus of opinion being that the year 1923 will be a very prosperous one.

The officers of the association for the coming year are: President, R. H. Sweetser, Columbus; first vice-president, C. R. Peebles, Ashland; second vice-president, W. M. Jeffries, Hanging Rock; third vice-president, A. E. Singleton, Portsmouth; fourth vice-president, M. M. Welden, Wellston; fifth vice-president, J. F. Savage, Hamilton; secretary-treasurer, D. H. Putnam, Ashland.

SILVER JUBILEE CONVENTION

American Ceramic Society's Elaborate Program for Pittsburgh Meeting

An elaborate program has been mapped out for the silver jubilee convention of the American Ceramic Society to be held at the William Penn and Fort Pitt hotels, Pittsburgh, Feb. 12 to 16, inclusive. The first three days will be given over to division meetings and the last two to plant visitations in the Pittsburgh district. There are seven divisions of the society and the sessions of these divisions all are to be held at the Fort Pitt Hotel, where also will be located the exhibit of ceramic products. The opening or general business and technical session will be held at the William Penn Hotel.

There will be much of interest to the iron and steel industry in the sessions of the refractories division on Feb. 13 and 14, at which the following papers will be read:

Analysis of High Alumina Ores and Refractories, by C. A. Underwood.

Testing Refractories, by W. J. Rees, Sheffield, Eng.

Development of Apparatus for the Determination of Heat Transfer Values in Refractories, by A. S. Watts.

Some Investigations Concerning the Influence of the Alkalies and the Alkali Earths on the Fusion Temperatures of Different Types of Refractory Clays, by A. S. Watts.

The Slag Test, by R. M. Howe.

Effect of Certain Gases at Various Temperatures upon the Structure of Refractory Brick, by R. M. Howe.

Resistance of Certain Types of Bricks to the Action of Slags, vs R. M. Howe.

Changes in Constitution of Fire Clays with Varying Heat Treatment, by A. A. Klein.

Chrome Refractories, by J. S. McDowell.

British Silica Brick, by W. J. Rees.

Prospecting for Fire Clays, by E. W. Hess.

Refractory Possibilities of Some Georgia Clays, by R. T. Stull.

Flint Clay Situation in Ohio, by W. Stout.

Flint Clay Situation in Pennsylvania, by Dr. G. Ashley.

Quantity Status of Flint Fire Clay in Maryland and Kentucky, by W. R. Jillson.

Quartzite of the Baraboo Range, by W. O. Hotchkiss.

Refractories from the Consumer's Standpoint, by R. F. Harrington.

Suspended Boiler Arches, by J. E. Harlow.

A Colloquium; Metallurgical Requirements of Refractories. Led by Dr. D. A. Lyon, U. S. Bureau of Mines.

Refractories and the Malleable Iron Plant, by A. F. Gorton and Mr. Swartz.

Refractories in Malleable Iron Furnaces, by H. G. Schurecht.

Refractory Requirements for Stokers, by George I. Barton.

Refractory Requirements for Oil Refining, by Alan G. Wikoff.

Silica Cement, by E. N. McGee.

Metallurgical Requirements of Refractories in Copper Smelting and Refining, by Francis B. Pyne.

Burning Refractories, by George A. Balz.
Burning Fire Clay Refractories, by E. H. Gartrell.
Some Problems in Burning Silica Refractories, by Fred A. Harvey.
Use of Pyrometers in Burning Refractories, by R. P. Brown.
Producer Gas for the Burning of Refractories, by W. D. Richardson.
Some Thermal Studies (Tentative), by M. F. Beecher.
A New Tunnel Kiln, by R. H. Miller.
Insulating Periodic Kilns, by J. H. Krusen.
Products of France, by R. V. Wideman.
A Study of Grog for Refractories, by W. G. Worcester.
Progress Report on Tests for Fire Brick Specifications, by R. S. Geller.

A banquet is to be held Monday evening, Feb. 12, while for Tuesday evening, Feb. 13, a supper and entertainment are scheduled. Plant visitations have been designed to meet the desires of the different groups.

To Standardize Engineering Abbreviations and Symbols

The American Engineering Standards Committee, whose machinery during the last four years has been the accepted medium for national standardization of raw materials, industrial processes and manufactured products in the engineering field, has been requested to call a conference to consider the standardization of abbreviations and of the symbols used in engineering equations and formulas.

The conference will determine whether unification of engineering abbreviations and symbols should be undertaken, and if so, what the scope of such work should be. The conference will meet in the board room of the American Society of Mechanical Engineers, Engineering Societies Building, New York, at 10 a. m., Tuesday, Feb. 13. The committee has provided a questionnaire through which organizations may send by mail, for consideration of the conference, such information as they consider desirable. Any organization desiring to be represented is requested to communicate with the American Engineering Standards Committee, 29 West Thirty-ninth Street, New York.

Research on Molding Sands

The committee on molding sand research, under the guidance of the Division of Engineering of National Research Council and American Foundrymen's Association, has made progress in its program of research. Many firms, universities, governmental departments and individuals are cooperating in the work. The investigation was made possible through an appropriation to the American Foundrymen's Association, which was later supplemented by National Research Council. In 1920 $7,500,000 was expended by foundrymen for new molding sands. Very little of it was reused. Much more might have been.

The subcommittee on geological surveys has prepared for the use of the State geological surveys, standard methods of making surveys of molding sand resources and preparing test samples. Some satisfactory deposits, which have been worked for years, are deteriorating while others are being seriously depleted. Excessive freight charges being paid by foundrymen to get sand from long distances may possibly be avoided by making available deposits now undeveloped which are near at hand. The States of Illinois, Virginia, Maryland, Alabama, Florida, Pennsylvania, Tennessee and New Jersey are already cooperating. Standardization of tests for determining size, shape, cohesiveness, permeability, water content, thermal properties, analyses (including rational, chemical, mineralogical), are still under way and some of them completed.

The subcommittee on conservation and reclamation has mailed 7500 questionnaires to gray iron, non-ferrous, steel and malleable foundries to obtain information on the proportions of sand reclaimed and methods of reclamation. The Ohio Brass Co. is making investigations for the use of clay in retaining bond strength in molding sand heaps. The Sivyer Steel Casting Co., Milwaukee, is studying the effect of clay additions on the grain size of sand heaps. The American Steel Foundries has reported on the method and equipment designed, which permits a recovery of about 70 per cent of refuse sand used in steel foundry work. Cost figures show that reclaimed sand costs about $1 per ton against new sand at the plant at $2.65 to $3.85 a ton. The process involves cleaning the sand grains of adhering fused material, then separating by air currents the good sand from the bad material.

Annual Dinner of New England Iron and Hardware Association

The New England Iron and Hardware Association held its thirtieth annual dinner Thursday evening, Jan. 25, at Hotel Somerset, Boston, approximately 200 members and guests attending. The committee of arrangements, of which Frank W. Brigham, Bethlehem Steel Corporation, was chairman, in providing speakers, deviated somewhat from the usual custom. Topics discussed by most of the speakers had little direct bearing on the iron and hardware industry, being of a national rather than strictly business nature.

Rear Admiral Henry A. Wiley, U. S. N., commanding the First Naval District, made a strong plea for a larger Navy. His ideas were decidedly not in accord with the Administration regarding the scrapping of a part of the Navy. He claimed there are many alien influences working against the Government, not only in respect to a bigger Navy, but other vital questions as well. "If you destroy your national defenses," he said, "you will have nothing to fall back upon if the crash comes. You cannot tell in this present troubled world when the next war will break out, and if it does break out you cannot tell whether we shall be drawn into it. The chances are we will. We have never been prepared for great emergencies in the past."

Joseph W. Powell, formerly president United States Shipping Board Emergency Fleet Corporation, hinted at the dangers growing within this country and made an extremely strong plea for those present to become interested in the Sentinels of the Republic, a society founded only a few months ago, and pledged to the support of the constitution of the United States. Hon. B. Loring Young, speaker of the Massachusetts House, representing the State at the dinner, gave interesting facts and figures showing Massachusetts had been placed on a strictly business basis during the past few years. Other speakers included Major General Andre W. Brewster, commanding the First Corps Area; Joseph H. Soliday, vice-president Massachusetts Bankers' Association, and the Rev. Francis W. Gibbs,. Fitchburg, Mass. Among those seated at the head table were E. P. Sanderson and F. H. Butts, former presidents American Iron, Steel and Heavy Hardware Association.

Myron B. Damon, Fitchburg Hardware Co., Fitchburg, Mass., president of the association, presided and introduced Hon. Samuel L. Powers as toastmaster.

Investigation of Welded Pressure Vessels

One of the many difficult problems concerning the Boiler Code Committee of the American Society of Mechanical Engineers in its effort to draw up satisfactory codes governing the construction of unfired pressure vessels was that of welding. Rules applicable to riveted constructions do not always apply to fabrication by welding. The problem is seriously complicated because of the meagreness of scientific data upon which to base proper requirements for safety without placing unjust restrictions on the use of welding.

A hydrostatic and hammer test was finally proposed for determining whether a vessel was safe for the purpose designed. The American Bureau of Welding, which is the advisory committee on welding research for the American Welding Society and the National Research Council, organized a pressure vessel committee to cooperate with the boiler code committee in determining the adequacy of the test proposed. Eight manufacturers placed at the disposal of the committee some 40 tanks and enough funds. These tanks have been tested to destruction by the U. S. Bureau of Standards.

The shells of most of the tanks were 6 ft. long and

2 ft. in diameter, and made of ⅜-in. mild steel plate. Both electric and oxy-acetylene welding were used. The hydrostatic and hammer test developed that the welded pressure vessel, according to the regular formulae for working pressure, has a factor of safety of about six.

February Meeting of Mining Engineers

The 127th meeting of the American Institute of Mining and Metallurgical Engineers will be held at the Engineering Societies Building, New York, Feb. 19 to 22. The program for the sessions devoted to iron and steel are tentatively announced as follows.

Tuesday, Feb. 20

2 p. m. Chairman, C. A. Meissner.
"Design and Operation of Roberts Coke Oven," by M. W. Ditto.
"Forms of Sulphur in Coal and Their Relation to Blast-Furnace Reactions," by A. R. Powell.
"Combustion in Fuel Beds of Blast-Furnace Cokes," by R. A. Sherman and John Blizard. Illustrated.
"Combustion of Coke in the Blast-Furnace Hearth," by G. H. J. Perrott and S. P. Kinney.
"Use of Magnetic Ore in the Blast Furnace," by G. P. Pilling.

Wednesday, Feb. 21

9:30 a. m. Chairman, Bradley Stoughton.
"Continued Discussion on Physics of Steel," by W. R. Webster.
"Specifications for Foundry Pig Iron," by Dr. Richard Moldenke.
"Influence of Temperature, Time and Rate of Cooling on Physical Properties of Carbon Steels," by H. M. Howe, F. B. Foley and J. H. Winlock.

2 p. m. Chairman, Dr. John A. Mathews.
"Deterioration of Malleable in the Hot Dip Galvanizing Process," by W. R. Bean.
"Heating and Cooling Curves of Large Ingots," by F. E. Bash.
"Possibilities in Application of Colloid Chemistry to Production of Clean Steel," by H. W. Gillett.
"Low-Temperature Brittleness in Silicon Steels," by Norman B. Pilling.

A session on the breakage of heat treatment is scheduled for 2 p. m. Monday, Feb. 19, with B. F. Tillson chairman.

Two sessions of the Institute of Metals are scheduled, one for 2 p. m. Tuesday, Feb. 20, and the other for 2 p. m. Wednesday, Feb. 21.

The regular smoker will be held Monday evening, Feb. 19, with the annual banquet arranged for the evening of Feb. 21 at the Waldorf-Astoria.

February Meeting of New York Electrochemists

A joint meeting with the New York section of the American Electro-chemical Society with three other chemical organizations of New York will be held at the Chemists' Club, Friday, Feb. 9, at 8.15 p. m. "The Present Situation in the Radium Industry" will be discussed by Harold E. Bishop, eastern manager, Radium Co. of Colorado. The recent sensational drop in price will be explained and the commercial uses of radium described. Some "Observations of Industrial Conditions in Europe" will be given by Dr. W. S. Landis, American Cyanamid Co., who has just returned from a visit to five European countries. The usual preliminary dinner will be held at the Chemists' Club at 6.30 p. m.

Inventions and Investments Exposition

To help coordinate finance and invention, by giving inventors an opportunity to show the manufacturer and financier the possibilities of their inventions, is the object of the International Exposition of Inventions and Investments, to be held Feb. 16 to 23, at the Grand Central Palace, New York.

The exhibitors will include companies regularly underwriting and financing industrials or other legitimate operations, and manufacturers or owners of patents or formulas upon which operations are about to begin or would be started if sufficient capital were available. Corporations requiring additional capital for development of their present operations or patents, and companies or individuals desiring to promote operations from inventions, are included also. Special invitations to manufacturers, investors, bankers and others to visit the exhibit will be issued. The exposition is under the auspices of the Universal Patent Exposition Corporation, Room 1108, Grand Central Palace, New York.

STILL FAVORS MEETING

Judge Gary Reaffirms His Position in Regard to an Economic Conference

Judge Elbert H. Gary, chairman United States Steel Corporation, in a lengthy article published in the New York *Times* of Sunday, Jan. 28, reaffirms the position which he took at the meeting last October of the American Iron and Steel Institute in advocating an international economic conference at Washington.

Judge Gary believes that if the United States is to do anything to help in the adjustment of the world's economic problems, it should be done at the earliest practical moment. He refers to the international conference of iron and steel manufacturers held in Brussels in 1911 and quotes from speeches made by himself and Sir John Randles at that time. He also refers to the organization of the United States Steel Corporation and the closer cooperation which in recent years has taken the place of destructive competition among steel manufacturers in the United States. He then argues that if improvement in business conditions can be brought about by cooperation, similar results can be brought about by nations acting in harmony. The conference should not, however, be made up of mere politicians, but, in the opinion of Judge Gary, be made up of statesmen and industrial leaders who know the needs of their respective countries and are willing to discuss them freely. In conclusion he says:

"It is not beyond the point to compare the world to a large corporation. To insure the success of the large body, each subsidiary body must be sound. The time has come for a meeting of company managers, the men who know what it is that clogs the wheels that ought to go around, but which today are standing idle. Until all wheels are turning merrily, no company—by which I mean no nation—will be living in the state of prosperity possible for it. People may say I am contemplating a Utopia when I speak of cooperation on this basis. They may say it can't be done. They are wrong. If people will be honest and intelligent and face the facts of the situation, they will agree that it needs to be done, and what needs to be done can be done."

A Steel Treaters' Handbook

Announcement is made by the American Society for Steel Treating that a handbook is about to be compiled and published known as the A. S. S. T. handbook, which will have the same relationship to the steel treating industry as the S. A. E. handbook has to the automotive industry and Kent's handbook to the engineering industry. There will be prepared and distributed in loose-leaf form data sheets relating to steel treating consisting of tables, charts and valuable information which should be in the hands of those interested in steel. These data sheets will form the basis of the handbook. D. K. Bullens, Philadelphia, author of "Steel and its Heat Treatment," has been selected as editor.

Meeting of Drill Steel Advisory Board

Notice of a meeting of the drill steel advisory board to the Bureau of Mines and the Bureau of Standards, to be held at 2 p. m., Feb. 19, 1923, at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, has been forwarded to members by D. A. Lyon, chief metallurgist, Bureau of Mines, who is secretary to the executive committee of the board. At this meeting there will be a discussion of the report written by F. B. Foley, H. S. Burnholz, and C. Y. Clayton on the present status of drill steel breakage and heat treatment.

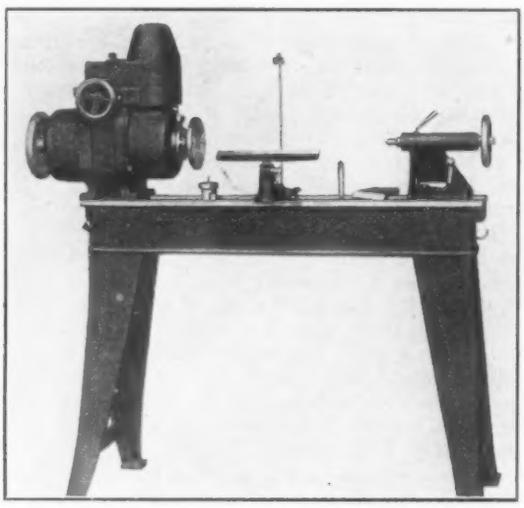
J. P. Gill, chief metallurgist Vanadium-Alloy Steel Co., Latrobe, Pa., delivered an address on "Tempering of Steel" before the Rockford, Ill., chapter of the American Society for Steel Treating, Jan. 19. His remarks were illustrated by lantern slides.

New Motor Head Speed Lathe for Alternating Current

A motor head speed lathe for alternating current, designated as the No. 51 and available to operate on any phase, cycle and commercial voltage, has been added to the line of the Oliver Machinery Co., Grand Rapids, Mich.

Two types of motor headstocks have been developed, a four speed motor head, and an adjustable speed motor head. The former has only four speeds and will operate only on 3 phase, 60 cycle, 220 volt current. The adjustable speed type has a wide range of speeds and will operate on any phase and any cycle, either 110 or 220 volt, alternating current.

The four speed motor head has a special ball bearing totally inclosed motor with hollow shaft or spindle. The speeds range from approximately 570 to 3450 r.p.m. at full load. The controller has a dust proof cover and is mounted in the leg of the machine. It is operated



Adjustable Speed Motor Head Lathe. The motor forms the headstock and with the control apparatus is entirely inclosed. The speed range is from 600 to 3600 r.p.m.

through bevel gears and a hand wheel on which the various speeds are marked. A safety inclosed cut-out switch is mounted on the leg below the hand wheel. Dynamic braking effect is obtained by throwing on the next lower speed.

The variable speed motor is said to be of exclusive design. In this machine the motor itself forms the headstock, both the motor and control apparatus being entirely inclosed. It is equipped with self-alining ball bearings rated to carry a 4 hp. radial load and 1 hp. thrust load. The motor is of the single phase, series compensated type and is available in any frequency from 25 to 60 cycles. The wiring from the main line to the motor comprises but two wires and connection is simple.

The entire controlling mechanism is contained in the motor. Speeds from 600 to 3600 r.p.m. are obtained by turning the handwheel. A governor of the centrifugal type, built in the motor, serves to maintain constant the speed desired, this being accomplished by increasing or decreasing the intervals during which the motor receives energy from the main line. Tension of the governor spring is adjustable by means of a hand wheel. A push button start and stop switch with cartridge type overload protection is incorporated in the motor.

The spindle is of steel tubing and is 1¼ in. in diameter with a ½-in. hole to facilitate removal of centers. The inside end is threaded for face plates and bored to receive No. 2 Morse Taper shanks, the outside end carrying a combined hand wheel and face plate for holding the spindle for removing front face plates, for use as a rear end face plate, for turning the spindle by hand or for quickly stopping the motor. The tailstock is of the open side design, and is secured to the bed by a positive lever clamp. On lathes with carriage a tailstock with set over device for taper work is provided. A hand feed tool carriage with cross feed and compound swivel rest may be provided.

On lathes having a tool carriage, the top of the bed and the guide of the cross slide are graduated by sixteenths and the ends of the carriage and cross slide are provided with pointers that may be adjusted to any work. This permits turning the work to a length or depth without having to fit and try, as usual.

The lathe will swing 12 in. diameter over the bed or 9½ in. over the carriage, and will turn 24 in. long between centers on a 48-in. bed or 36 in. long on a 60-in. bed. Either long floor legs or bench legs may be provided.

Seasonal Employment in Building Construction

In a recent report by the president of the Philadelphia Building Congress, published in *Engineering News Record*, it is argued that, because of the seasonal character of the work, the average building worker is inadequately recompensed. The analysis shows that nearly every type of building laborer in Philadelphia in 1920 lost about 100 working days, the maximum being 123 days for iron workers, while the minimum loss was 64 days for building laborers.

These lost days are based, not upon a full year of 313 week days, but upon a year in which Saturday is either a full holiday or a half holiday in every case, and there are several other holidays. Thus, the maximum number of effective working days varies with the different branches of the industry from 255 days for plasterers, painters and paper hangers, who take all Saturdays as complete holidays, to 282 days for tile setters and their helpers, who recognize only five holidays outside the Saturday half holidays. The average number of days actually worked during the year runs from a maximum of 217 for building laborers to a minimum of 152 for iron workers and 170 for plasterers and slate and tile roofers.

While the daily rate in Philadelphia, during the year, ran as high as $14 for plasterers and $10 for bricklayers, giving theoretical annual earnings amounting to $3,570 for the former and $2,750 for the latter, the average annual earnings for plasterers amounted to only $2,380 and for bricklayers $1,820, because of the excessive lost time. In only one trade of the entire list did the actual earnings reach $2,000 per year, and in only two other cases did they exceed $1,700.

The building fraternity must reckon with bad weather. Working in the open to a large extent, their work is seriously interfered with by rain or snow and frequently to as great a degree by extremity of cold. Progress in the building art in the past 20 years has taught us how to place concrete safely with the thermometer below zero, but it does not follow necessarily that all other types of building labor can work effectively under such conditions.

Woodstock Properties to Be Sold

BIRMINGHAM, ALA., Jan. 29.—Properties of the Woodstock Iron & Steel Corporation are advertised for sale by the Woodstock Operating Corporation, L. C. Crewe, president and general manager, La Follette, Tenn. They are offered in whole or in part and consist of a blast furnace in good condition at Anniston, Ala., ore mines at Cedartown, Ga., and Rendalia, Ala., quarries at Rock Springs, Ala., and several thousand acres of mineral and farm land, etc. The offer of sale is by owners, among whom are Crocker Bros., N. Y. The furnace has not been operated since the depression following the war. Mr. Crewe is operator of the blast furnace property at La Follette.

E. M. Statler, owner of the Statler Hotel, Detroit, has announced plans covering the erection of an 18-story hotel at High Street and Woodward Avenue, Detroit. The estimated cost of the land and building is approximately $12,000,000. The Book estate has completed plans for a 25-story hotel, operations to begin with the razing of the Hotel Cadillac July 1.

Calorific Value of Steel-Making Elements

Behavior of Phosphorus, Manganese, Chromium and Other Metals in Steel Processes Explained—Peculiarities of Sulphur—General Remarks

BY HENRY D. HIBBARD

[*The first and second installments of this discussion appeared in* THE IRON AGE *Jan.* 11 *and* 18. *They dealt with calorific rôle of oxygen, carbon, silicon, aluminum and magnesium.*]

Phosphorus

Phosphorus to P_2O_5, 5892 calories: This element is readily oxidized and therefore eliminated from iron under certain conditions hereinafter stated. The molten iron must be served with an ample supply of oxygen, temperatures within certain limits must be maintained, and an adequate amount of free base, usually oxide of iron or oxide of calcium must be at hand ready for the phosphoric acid (P_2O_5) formed to combine with. In some processes carbon may be and in others may not be present in the metal, during the elimination of phosphorus from it.

Any acid present, such as silicic acid, which is stronger at the temperature of the iron than phosphoric acid, will seize any bases present, as in the slag, to form a compound not more acid than a tribasic salt. Then the phosphoric acid will unite with any excess of bases, beyond that combined with the stronger acid, and form triphosphates or tetraphosphates of those bases. Should such excess of base be lacking the phosphorus will largely remain in the metal. Practically the slag, if a silicate, as most if not all iron and steel slags are, must not contain more than 24 per cent of silica (SiO_2) to remove from iron any useful amount of phosphorus. If fairly complete dephosphorization is desired to give, say, under 0.05 per cent in the metal, or if the charge has rather high phosphorus content, say, over 0.60 per cent, the silica in the slag should not be over 20 per cent, or, to make sure, preferably lower than even that or about 15 per cent. In the acid processes, crucible, open-hearth, Bessemer or electric, the phosphorus in the charge is all retained in the metal.

Oxidation of Phosphorus in Different Processes

The source of the oxygen to oxidize the phosphorus may be the air, as in the basic Bessemer process, or oxide of iron either formed by oxidation of the charge before and during melting, or added as ore in the basic open-hearth, puddling and washing processes. In the basic Bessemer process the oxidation of the phosphorus generates a large part of the heat required to carry on the operation, but it can be oxidized freely only after the carbon has all been consumed. It is then burned to P_2O_5 which combines with lime added for that purpose.

In the washing process crude molten iron is contacted with oxide of iron at temperatures between 1250 and 1350 deg. C. Silicon and phosphorus are almost completely oxidized and eliminated from the iron, and that in the presence of over 3 per cent of carbon which is retained in the metal.

In the puddling process crude iron is melted and exposed to the action of both oxide of iron and oxygen of the air at temperatures between 1300 and 1420 deg. C, somewhat higher than in the washing process, and, in addition to the elements removed in that process, the carbon is almost wholly oxidized and so taken from the iron.

In the basic open-hearth process at still higher temperatures, between 1400 and 1550 deg. C, and with the metal protected from atmospheric oxygen by a layer of slag, silicon and phosphorus are oxidized and eliminated in the presence of considerable carbon. In the cold pig and scrap variation they may be largely oxidized with a carbon content of over one per cent.

In the basic Bessemer the temperature is again higher, from 1550 to 1600 deg. C and the phosphorus is not oxidized until the carbon is practically all burnt and gone from the metal.

Affinity of Phosphorus and Carbon

The relative affinities of phosphorus and carbon for oxygen are therefore seen to be reversible. At temperatures below 1400 deg. C the phosphorus is the stronger while the carbon is so at higher temperatures above 1550 deg. C. The temperature at which reversion takes place for any set of conditions lies somewhere between the two. At high temperatures the carbon not only seizes the oxygen which reaches the metal, but also has power to take it from the phosphoric acid which may have been already formed reducing the phosphorus which again enters and combines with the iron. This reversion of phosphorus to the metal from the slag may also take place at normal steel temperatures if the silica in the slag rises above 25 per cent as it may by taking up silica or silicates from the acid ladle lining. Trouble from this source is particularly liable to be encountered when the time of teeming is unduly long because of a large number of molds to be teemed as in some steel-casting plants.

Before the basic process was discovered it was held by iron makers that the elimination of phosphorus from iron could take place only at temperatures below the fusion point of steel. Hence puddling would remove it while steel-melting would not. Thomas recognized that basic environment was the essential and that phosphorus could be oxidized and eliminated at steel-melting temperatures if there was no carbon present to prevent it.

Titanium

Titanium to TiO_2, 4540 calories: Titanium acts much like silicon in its relation to carbon in molten iron, though it is perhaps more quickly oxidized in spite of its lower calorific power. Its solvent power on the gases is nearly as great as that of silicon and steel may usually be killed by the addition of 0.30 per cent of it. The melting point of titanic acid (TiO_2) is given as 1700 deg. C, which puts it in about the same class as silica which melts at 1750 deg. C. Like silica it will remain infusible and suspended in the liquid metal at about 1550 deg. C unless fluxed or coalesced by some fusible or plastic ingredient.

Chromium

Chromium to Cr_2O_3, 3000 (?) calories: The calorific power of chromium has not been determined to the writer's knowledge but the figure of 3000 calories was estimated and assumed as its calorific power by the late Prof. J. W. Richards.

Chromium is quite freely oxidized in the presence of carbon. When Mayari iron is blown in the Bessemer converter, about 85 or 90 per cent of the 2.50 per cent of chromium it contains is oxidized by the blast, the higher figure, occurring when the temperature of the blow is kept down as near the fusion point of the metal as practicable.

Certain open-hearth steel made from blown Mayari iron was found to contain about 0.30 per cent of chromium though the blown iron was reported to have much less. The explanation was that some chromic oxide was held in suspension in the blown iron and so escaped the chemist, being reduced by carbon in the open-hearth furnace to chrominm which alloyed with the metal.

Chromium has little or no influence on or control

of the gases of steel. It neither solidifies steel nor increases the gasholes.

Sulphur

Sulphur to SO_2, 2164 calories: This element presents an anomaly inasmuch as it has a higher calorific power than iron and yet it cannot be eliminated from iron by oxidation. At steel-making temperatures the affinity of sulphur for iron is apparently greater than its affinity for oxygen, though in forming iron sulphide (FeS) the calories developed per kilogram of sulphur are given, in the books, as 750 while in forming sulphurous anhydride (SO_2), the usual product of burning sulphur by atmospheric oxygen, the generation of 2164 cal. is given. Presumably the temperature of dissociation of SO_2 is below that of molten steel (about 1550 deg. C) which, if so, explains the anomaly.

Sulphur exists in iron as a sulphide, either of iron in solution or of manganese, which is insoluble, in suspension. When sulphide of iron is eliminated from iron, it is by liquation and not by oxidation but as a base, usually either calcium or manganese or both must be at hand for the sulphur to combine with. Uniting with calcium to form CaS sulphur generates 2947 cals. per kg., and with manganese to form MnS, 1422 cals. Both these quantities of heat are greater than that generated by sulphur uniting with iron, as stated above, which accounts for the action of sulphur in combining with them in preference to iron under suitable conditions.

Sulphur and Manganese

When manganese is added to molten iron containing sulphur manganese, sulphide is formed and precipitated in minute particles. These coalesce when they touch each other and grow in size as do the silicates already referred to with which, however, they are immiscible. When large enough they are floated to the surface where, if it be bare metal without a covering of slag, the oxygen of the air oxidizes both the manganese and the sulphur, the former remaining to form a slag, while the latter escapes into the air as SO_2, which may be detected by its odor. When the manganese content is high, as in manganese steel, the evolution of sulphur in the manner described is particularly strong and complete. This ability of oxygen to combine with sulphur when it is already combined with manganese, while it cannot do so with sulphur combined with iron, is noteworthy. The matter is different, however, as in one case the sulphur and the metal are both oxidized, while in the other only the sulphur would be (if it occurred), the iron remaining in the metallic form. The temperature of the manganese sulphide is, of course, somewhat lower than that of the molten steel on which it rests, but not much.

Only at temperatures not above bright redness can oxygen burn sulphur in sulphide of iron as in roasting sulphide ores and in burning pyrites (FeS_2), as in making sulphuric acid. If the sulphide is fused, its oxidation is checked.

In the mixer, if the molten crude iron has high manganese content, say over one per cent, there may be an important elimination of sulphur. In one run of about 5 weeks with iron containing 1.5 per cent of manganese, the sulphur content was diminished from 0.12 to 0.04 per cent, or two-thirds eliminated.

In the washing process sulphur is eliminated more fully than in the steel-making processes, or about one-third, and in puddling more than in washing, or from a half to three-quarters of that contained in the crude iron. This last is due probably to the more intimate mixing of the iron and cinder. It does not appear that these differences in sulphur elimination are due to differences in temperature, as puddling is hotter than washing and not so hot as steel-melting.

Sulphur Absorption from Fuels

There is yet another anomaly regarding the behavior of sulphur at high temperatures. The harmful absorption of sulphur from the gas in melting cold scrap in the open-hearth steel furnace with high sulphur fuel has been known for forty years or more, but now it is claimed that if the sulphur is burned to sulphurous acid (SO_2) before it comes in contact with hot iron, it will not be largely absorbed.

To so burn the sulphur, the flame must be developed farther from the charge than with low sulphur fuel, either producer gas, oil or tar. From the behavior of sulphur already recorded above it might be supposed that the burned sulphur would let its oxygen go and seize iron instead, if it had a chance.

Vanadium

Vanadium to V_2O_5, 2000 (?) calories: The calorific power of vanadium has not, to the writer's knowledge, been determined, but has been assumed as given above. It is clearly above that of iron for when added to steel in small proportion, not over 0.10 per cent, it is all oxidized and leaves the metal and is not to be found in the finished steel. Nevertheless the benefit it confers on high-speed steel is evidently as an alloy and not as a deoxidizer.

Manganese

Manganese to Mn_3O_4, 1988 calories: This element, the great savior of most steels, acts in an unexpected manner with regard to its calorific power which is not much greater than that of iron and far less than that of silicon. Yet in the Bessemer blow, manganese is oxidized partly with and closely following the silicon (which is the first to be burned) by the oxygen of the blast.

In melting ferromanganese in a graphite crucible or pot, if it be held in the molten state in the furnace, some silicon will be reduced from its combined form in the acid slag to its elemental form which enters and merges with the metal of the charge. A part of the manganese will be oxidized at the same time and enter the slag.

Such a result is anomalous and would not be foretold when the calorific powers of the two elements are compared. It would naturally be supposed that silicon, if present in any considerable proportion, would completely protect manganese from combination with oxygen. This supposition was the basis of a patent issued many years ago to two scientists for a method of reducing manganese from its ores by the use of a high silicon alloy. It was a plausible assumption, but no case of such action has come to the writer's notice. Perhaps with a great enough proportion of silicon present at a sufficiently high temperature, some manganese might be reduced. If so there would be, at some relative proportion of the two for a given temperature, a state of equilibrium at which neither element would have power to reduce the other. If such a proportion exists, it will probably vary within limits with the temperature.

Manganese having power to reduce silicon, which will protect carbon in iron from oxidation, it becomes natural to assume that it will itself protect carbon from oxidation, at least as effectively as silicon does, but it falls far short of doing so. In the basic open-hearth with a considerable percentage of manganese in the metal, that is, 0.50 or 0.60 per cent, carbon may be freely oxidized so as to give the bath a fairly lively boiling action during which some manganese as well as some iron are reduced from their oxides to enter the metal.

Manganese and Effervescing Steel

Manganese has relatively but little solvent power on the gases of molten steel. In making effervescing steel, however, it seems to be the cause of the steel rising in the mold when it is too hot. Effervescing steel is the kind which evolves large quantities of gas in the mold, which causes the metal to "churn," and which throws up a spray of sparks. When properly made the steel neither rises nor falls during solidification, but freezes in progressively from the sides forming first a rim all around the outside next to the mold. This "rimming in," as it is called in the shop, continues until all is solid or until the center portion has become mushy (when a cap is put on) and the ingot has a flat top. To give a proper effervescence the metal in the furnace must be properly charged with gas, chiefly carbonic oxide (CO), which is indicated by the manner of boil the charge exhibits. If now the casting tem-

perature is too high, the evolution of gas is inadequate, the steel does not churn properly, perhaps not at all, in the worst cases, the steel rises in the mold and the ingot is infested with skin-holes, which are gas-holes close to the surface, which spoil it for almost every purpose. The higher the temperature, the more numerous the holes.

The explanation seems to be that at the high temperature the manganese has power to dissociate the carbonic oxide which it does not possess at the lower, correct temperature, uniting with its oxygen, the carbon returning to the bath. The needed effervescence is, therefore, lacking, and the gas bubbles (hydrogen presumably), which form the skin holes, are not dislodged, as they would be by adequate motion of the fluid steel, but remain to form fatal defects.

In support of this explanation it may be said that there seems to be something like a critical temperature or a narrow range of temperature between the proper degree of heat and one too high. If the matter were merely one of solution of the gases, the solubility would be likely to vary with the temperature in a way.

In the washing process manganese in the crude iron is oxidized with the silicon early in the operation, both elements being practically absent in the washed metal.

Nickel

Nickel to NiO, 1051 *calories:* Nickel once alloyed with iron may not be again separated as long as the iron remains in the metallic form. The iron protects the nickel from oxidation. Nickel has been so generally added to iron since the development of nickel steel about thirty years ago that any steel made from a charge, part of which is steel scrap, is likely to contain some nickel which has persisted in the iron, regardless of how many times it has been remelted.

Arsenic

Arsenic to As_2O_5, 1042 *calories:* Arsenic falls in the same group with phosphorous in the periodic law and behaves similarly in some chemical reactions employed in the analysis of iron. Consequently it was supposed, when the elimination of phosphorous from iron in the basic process was discovered, that the arsenic would likewise be oxidized and go with the phosphorous into the slag. When it was found, however, that the arsenic remained in the metal, astonishment was generally felt among steel metallurgists. Its low calorific power explains its action in that respect.

The affect of arsenic on the properties of steel when it occurs in the relatively small proportions commonly present or under 0.10 per cent is practically negligible.

Copper

Copper to CuO, 593 *calories:* This element, once incorporated in iron, should persist and not be removable by oxidation. In a general way it does so, but it is claimed that in some small Bessemer converters a considerable part, 30 per cent at one works, leaves the iron during the blow and enters the slag. This, if true, is anomalous.

General Remarks

The percentages in iron of the irremovable elements of lower calorific power than that of iron, that is, nickel, molybdenum, arsenic tungsten and copper, may only be diminished by dilution with iron comparatively free from them. Some of these elements which are desired in and are, therefore, added to steel have been in the past added to the molten iron in the form of oxide. An equivalent of iron readily reduces such an oxide, being itself oxidized, and setting free the metal which alloys with the molten iron. Nickel, molybdenum and tungsten have been so added. Nevertheless, since these metals have been obtainable as metals or in rich iron alloys, they have been added in such forms because of the obvious advantages.

In the recovery or utilization of alloying elements in alloy steel scrap, their calorific powers play an important part. Elements of lower calorific power than iron will be retained in the metal when it is remelted and so saved, while those of higher calorific power will be oxidized and lost in the slag. Thus nickel, copper, tungsten and molybdenum may be used again, while manganese, silicon, aluminum, titanium and other elements of high calorific power will be lost or demand special treatments involving protection of such elements from oxygen during melting to save them, which even then may perhaps be done only in part.

"Story of Alloy Steel" Told by Moving Pictures in Chicago

"The Story of Alloy Steel," a film made by the Interstate Iron & Steel Co., Chicago, was shown by Paul Llewellyn, manager of bar sales of that company, at a meeting of the Purchasing Agents' Association of Chicago, at the Hardware Club, Chicago, Jan. 11. In his explanatory remarks, Mr. Llewellyn called attention to the tremendous increase in alloy steel production in the United States in the last 15 to 20 years. Statistics published by THE IRON AGE, he said, indicated that in 1905 only one ton of alloy steel was produced for 200 tons of common steel. In 1910 this ratio had changed to one ton of alloy to 50 tons of common steel. In 1919, one ton of alloy steel was made for every 25 tons of common steel. In the 14-year period, then, there was a net increase of 700 per cent in the proportional output of alloy steel.

"The immense importance of alloy steel," he asserted, "can best be summed up by stating unreservedly that its adoption has made the automobile what it is today. Other industries using steel are rapidly realizing this, and we believe we have only started in the general use of better steels.

"Alloy steel," he added, "is used principally at this time in the manufacture of important and vital parts of automobiles, tractors, locomotives, engines, hand and machine tools and some mining equipment. It has been adopted in these cases where great strength with low weight is required, such as in the reciprocating parts of engines or motors as connecting rods, pins and crankshafts. It has also been adopted where toughness combined with a hard surface is required, as in the case of gears and shafts, and power transmission units; also where great resiliency and power to resist fatigue is required, as in automobile and locomotive springs."

Seymour Wheeler, Pickands, Brown & Co., pig iron merchants, Chicago, also gave an illustrated lecture on pig iron entitled "From Ore to Pigs."

Volume vs. Weight

In a 20-page pamphlet published by John Roger, 32 West Fortieth Street, New York, the relationship between volume and weight as a measure of quantity of matter is taken up in some detail. Mr. Roger argues that the present theory of physical science rests on an entirely wrong basis "in assuming that elements are proportionally comparable by weight, i. e., by the action of the terrestrial field of force on them, whereas they are necessarily proportionally comparable by their internal forces of cohesion, i.e., by the action of the atomic field of force within them, the weight having nothing directly to do with the matter." Diagrams and tables are given, showing some of the properties of the principal metals and some other elements. Argument is made, from the particulars thus developed, along the lines covered above.

Rates on slag from Anniston to Gadsden, Ala., during Federal control, were not unreasonable, according to a decision the Interstate Commerce Commission has rendered in dismissing the complaint of the Southern Manganese Corporation vs. Director General. The distance scale rate of 80c. per ton was applied for the 30 miles between the two points.

The total output of bituminous coal for the week of Jan. 15 to 20 is reported to be about 10,900,00 to 11,000,000 tons, according to the Geological Survey.

AUSTRIAN STEEL AND IRON

How Currency Reforms Encouraged Imports and Checked Exports

VIENNA, AUSTRIA, Jan. 15.—The relative price-stability brought by the currency reform has produced a serious crisis in Austria's iron and steel. At the end of 1922 Austria had 110,000 unemployed. Of 86,000 metal workers in Vienna, only 26,000 were working full hours. After an enormous price-rise, which reached its height in late 1922, followed a moderate price-fall, but with the German mark exchange then dropping headlong and German mark prices rising relatively slowly, Austria's gold price-level rose to about double Germany's, with the result that late last year Austrian buyers began to invade Germany, precisely as did buyers from high-exchange countries. Even with Czecho-Slovakia, which itself suffers badly from currency appreciation, Austria is now unable to compete.

On Jan. 1 the weekly wage of an Austrian steel employee was 380,000 crowns and of a German, at the then exchange, only 252,000 crowns; Austrian coal cost 520 crowns a kilo, German 260 crowns; Austrian bars, 4500 crowns and German bars, 3500 crowns. And with these initial cost prices a locomotive that cost Austria 2000 million crowns to produce was being turned out by Germany at 1200 million crowns.

Austria's greatest heavy iron and machinery concerns suffered first. In late December the Woellersdorf Werke Co., a former state concern, which was handed over in June, 1922, to a private company in which the German General Electricity Co. owns two-thirds of the stock, announced that it must close down. Apart from inability to compete with German producing concerns, the Woellersdorf company was badly hit by the suppression of its munitions output by the Inter-Allied Commission. The other great Austrian concern, the Alpine-Montan Gesellschaft, passed in 1921 into the hands of Stinnes, who, it is complained, has neglected it. The Alpine company cannot compete with Germany's cheap production. It has, in addition to debts totalling many billion crowns to Vienna banks, a debt of 70,000,000 crowns to Czecho-Slovak banks; and as the capital increase of 85 billion crowns lately decided on is not sufficient to get it out of difficulties, it has been negotiating to raise £500,000 on security of bonds.

Low Pig Iron Production

Austria's pig-iron production is at best small; but it plays an important rôle in a country notable for machinery exports. The pre-war production of pig iron was 600,000 metric tons per annum. In 1920 this fell to 100,010 tons, in 1922 recovered to 226,087 tons, and in the first nine months of 1922 was 244,000 tons. The general tendency has been upward. Steel production in 1920 was 198,497 tons; in 1921, 293,862 tons, and for first nine months of 1922, 363,000 tons. Of iron ore Austria in these nine months produced 981,000 tons, and of coal 2,459,000 tons. The Alpine company dominates in all three branches. Except in coal its production has tended to make a rapid recovery since the war, and in 1920-21 it increased its number of employees by 3000.

The price rise for all these products was extreme before the prospect of currency reform stopped the upward movement. In the three months of July-September, pig iron rose from 370,000 to 2,647,500 crowns per metric ton; bars from 425,000 to 2,962,000 crowns; thick sheets from 532,000 to 3,772,500 crowns, and wire from 370,000 to 2,647,500 crowns.

Exports Negligible

Foreign trade in iron and steel has of late developed unsatisfactorily. In 1920 the export of iron and steel and of iron and steel goods of all kinds considerably exceeded the import; but in 1921 this process was reversed. Although figures for 1922 are not yet available, it is known that export in many branches almost entirely ceased during the latter part of the year. Normally 75 per cent of Austria's machinery production is exported, but there was a complete cessation of new orders last fall. The iron construction workshops and bridge material shops lately completed their deliveries to Jugo-Slavia, and they report that there is no prospect of fresh orders; and the tool and machine tool branches state that a very considerable price-cut, decided on as a measure against German competition, has failed to attract buyers.

RUHR AFFECTS FRENCH MARKET

Blast Furnaces Feel Coke Shortage—Political Developments Awaited—Year's Production Under Pre-War Total

PARIS, FRANCE, Jan. 11.—The uncertainty of the issue of the present occupation of the Ruhr district is greatly affecting the French iron and steel market, which is for the present unsettled. During December, the Société des Cokes de Hauts-Fourneaux placed at the disposal of French blast furnaces only 345,000 tons of German coke, 65,000 tons less than the tonnage specified in the schedule of the Commission of Reparations.

The Société des Cokes de Haut-Fourneaux was renewed Feb. 1, for one year and it was decided that there should be henceforth two prices of coke: A minimum charged to blast furnaces on coke consumed up to 40 and 50 per cent of their capacity, and a maximum charged beyond that rate of production. For February, this minimum price has been fixed at 110 fr. and will probably be raised to 125 fr. in March, while the maximum price fixed is 155 fr. per ton. Under the new contract, the société des cokes is still allocating export bounties on coke used in the making of exported products.

Iron Ore.—Although the shortage of labor is limiting the production of the iron mines of Eastern France, their present situation may be considered satisfactory. Briey iron mines have practically no available supplies, and those of Lorraine are gradually reducing their stocks. On the other hand, Longwy siliceous iron ores are used extensively by neighboring French and Belgian furnaces, which cost 9.50 fr. to 11 fr. per metric ton, against 14 to 17 fr. for Briey ores. The only district where important stocks still exist is the Nancy district, which produces siliceous ore, but is situated farther from consuming centers.

Pig Iron.—France produced, during the first eleven months of 1922, 4,615,000 tons of pig iron. Estimating the December production at 500,000 tons, we arrive at a total for last year of 5,115,000 tons, compared with the production in 1913 (without Alsace-Lorraine) of 5,311,000 tons. On Nov. 30 there were, out of 221 furnaces, 116 in blast, 47 ready for operation and 58 under construction or repair.

There is practically no available supply of foundry pig iron for January. Prices of chill cast foundry iron No. 3 P. L. vary between 255 and 270 fr. per ton at furnaces for January and between 270 and 280 fr. for February delivery. The export price f.o.b. Antwerp (Belgian currency) is: 300 to 310 fr. per ton.

Hematite pig iron is now quiet, but with order books full many producers are declining to quote, because of the uncertainty of the coming months. The present prices at furnaces are between 310 and 345 fr., according to districts and analysis. The price delivered in the Paris area is 375 to 385 fr., 30 to 40 fr. per ton under the price of British hematite.

Semi-Finished Material.—From Jan. 1 to Nov. 30, 1922, France produced 4,057,000 tons of steel. Estimating the December production at 400,000 tons, the year's production was 4,457,000 tons, instead of 4,635,000 tons (without Alsace-Lorraine) in 1913. The November production totaled 410,500 tons. The market is dull. There are very few offers of material, because of the uncertainty of future prospects, and prices are variable: basic blooms, for instance, are quoted on the inland

market at 340 to 370 fr. and billets at 380 to 390 fr. The latest prices f.o.b. Antwerp per metric ton (Belgian currency) are:

	Fr.
Ingots	340
Blooms	360
Billets	390
Sheet billets	410 to 420

Beams.—There are no special features to report in the market on beams, which will probably remain rather inactive until the works have completed orders on their books sufficient for the next two or three months. Some Lorraine producers are quoting 460 fr. at works for delivery within 8 to 12 weeks. The conclusion of sliding scale contracts is also reported on a basis of 440 fr. at producing works, with coke at 95 fr., and 2 fr. increase for each franc added to the price of coke. This arrangement brings the price of beams for delivery in February to 470 fr. The export price f.o.b. Antwerp (Belgian currency) is: 390 to 400 fr. per ton.

There has been talk of re-establishing the Comptoir Sidérurgique, but for beams alone. However, as producers now hope to sell their beams on the base of 440 to 460 fr. at works, and the average price of the comptoir for March to December was 420 fr., they will probably prefer to wait.

Sheets and Plates.—The last of the large comptoirs in the French iron and steel trade, the Comptoir des Tôles et Larges Plats, ceased to exist at the end of last year, simultaneously with the Comptoir Sidérurgique. This dissolution, which was unexpected, was caused by the refusal of the Société des Aciéries de France to join the comptoir on the same terms as the other members.

During its last month of existence, the comptoir had booked a record figure of 50,000 tons. In consequence a fall in the prices of heavy sheets is not at all unlikely, especially as the shipbuilding yards are inactive, but no such decline is expected in medium and light sheets, the production of which is much below national requirements. At the present rate of exchange British competition is almost out of the question. On the other hand, inroads of Belgian sheets may be expected.

Rolled Merchant Products.—Prices of these products reflect the rise in the price of coke. While some works are still quoting 460 and 470 fr. per ton, other works refuse to sell under 480 fr. for February and 490 to 500 fr. for March delivery. These prices are at producing works in the East. In the North, the prices vary between 510 and 530 fr. Delays of delivery are generally from two to three months; but concrete bars can only be delivered with three or four months' delay.

Rods are being quoted 520 to 530 fr. in Lorraine and the Saar for small orders, with slight concessions for heavier tonnages.

JAPAN BUYS CHINESE TIN

Product Cheaper Than Australian or Straits—Japanese Market for Agricultural Machinery

SHANGHAI, CHINA, Jan. 13.—There has been a great deal of buying recently of Hongkong tin by Japanese houses in Shanghai, for shipment to consumers in the Shoshing district. Merchants of this district have been buying an average of 350 slabs of tin a day, almost without interruption since June. But this month it fell off 50 per cent., and the present demand does not exceed 170 slabs a day. During the last few months this particular district bought about 56,000 piculs (80,000 slabs or 7,500,000 lb.) of tin, all of it supplied by Hongkong.

As Hongkong tin, otherwise known as Kwa Hung tin, is cheaper at present than Australian, Banca and Straits tin, preference has been shown for it. The demand for tin in Shanghai is principally for conversion into tin foil.

There is also a demand by the Chinese consumers in Shanghai for a metal called "half tin," which is dealt in in large quantities. When the price of tin is beyond 50 taels per picul ex-godown (27.2c. per lb.), the Chinese factories purchase this mixture called "half tin."

There is very little new business in the Shanghai market. It is stated that some orders have in recent weeks been placed in Germany. Prices in the United States and in Great Britain are higher than those the German manufacturers can offer. German sellers are making a strong effort to capture this market, and in the interior they have been successful in securing some large orders on low bids.

High Cost of Steel Making in Australia

WASHINGTON, Jan. 30.—Costs of producing railroad steel in Australia are so high that requirements are being purchased from England, which are being obtained at lower charges, with duty paid, than it can be made in Australia. Discriminating duties in favor of the British as against the steel industry in the United States will make it necessary for domestic producers to overcome this duty if they are to compete with Great Britain in the Australian market.

Pointing out the situation, Consul Henry H. Balch, Adelaide, Australia, in a report received by the Department of Commerce, says that the South Australian Government is now purchasing steel rails and fish plates from England for the State railroads. It has been found, he says, that after the duty and freight are paid, these requirements may be laid down at Port Adelaide considerably cheaper than the cost of manufacturing in Australia.

According to information furnished by the Commissioner of Railways, an American railroad man, thoroughly acquainted with American manufacturing costs, a ton of Australian steel, 80 lb. to the yard, cost in Port Adelaide £14 13s. 6d., while 80-lb. rails, made in England, landed on the wharf at Port Adelaide, including freight and duty, cost only £11 5s. per ton. Similarly, Australian fish plates now cost £19 7s. 6d., while English fish plates are about £12, including freight and duty.

The duty on steel rails weighing 50 lb. per yard and over from England is 35s. per ton, as against a duty of 75s. per ton for American rails. The duty on English fish plates, tie plates and rods is 48s. per ton, and on the American products 95s. per ton.

"If American manufacturers of steel rails and fish plates, rods, fish bolts, switches, etc., are able to overcome the higher duty by offering lower prices than the English concerns now supplying the trade," says Consul Balch, "there should be an opening for an important trade not only with the railways of South Australia but with the State-owned railways of the other States of Australia."

Hardening Drills in South Africa

The introduction of improved furnaces has enabled the hardening of steel to be carried out by unskilled labor. Hitherto the work of sharpening the drills has been confined to skilled whites, and this policy was upheld by the Mining Industry Board, which reported against the employment of natives for this purpose. The new drill-hardening furnaces make it impossible for tools to become overheated, owing to the fact that the correct quenching temperature is automatically registered, and the personal judgment of the operator thereby eliminated.

Japanese Steel and Iron Imports Increase

Imports of iron and steel into Japan during the first 10 months of 1922 were 1,305,633 tons. During the corresponding period of 1921 only 713,441 tons were purchased from foreign countries. This 82 per cent increase was effected although stocks on hand in Japan were very large. Two factors that contributed to this increase, says Luther Becker, chief of the Iron and Steel Division of the Department of Commerce, were

the placing in the Japanese market of large quantities of Indian pig iron at prices that domestic blast furnaces could not undercut, and the quickening of competition from German iron and steel producers.

Pig iron, plates and sheets, bars, rods, angles and rails are the leading articles of importation.

The United States, Germany, Great Britain, China, British India, Kwantung Province (South Manchuria) and Belgium were the most important sources of these imports.

Steel Plants and Blast Furnaces in the Ruhr

Of interest as bearing on the Ruhr situation and the steel industry in Germany, the London *Ironmonger* for Jan. 13 publishes the following list of the more important iron and steel works situated in the Ruhr Valley, together with the number of blast furnaces, converters and open-hearth furnaces:

Works	No. of Blast Furnaces	No. of Steel Furnaces
A.G. für Hüttenbetrieb, Duisburg	5	..
August Thyssen-Hütte, Hamborn	6	18
Bochumer Verein, Bochum	5	15
Deutsch-Luxemburgische Bergwerks und Hütten A.G., Dortmund	10	27
Duisburger Kupferhütte, Duisburg	6	..
Eisen und Stahlwerk Hoesch, Dortmund	7	13
Gelsenkirchener Bergwerks A. G., Gelsenkirchen	11	4
Gelsenkirchener Gussstahl und Eisenwerks	..	11
Gutehoffnungshütte, Oberhausen	11	18
Fried. Krupp A.G., Rheinhausen	17	70
Phœnix A.G., Hoerde, Dortmund and Duisburg	18	29
Rheinische Stahlwerke, Duisburg	6	14
Westfälische Eisen und Drahtwerke, Aplerbeck	3	3
Bergische Stahlindustrie, Remscheid	..	12
Deutsche Werke, Siegburg	..	7
Mannesmann Tube Works, Gelsenkirchen and Duisburg	..	11
"Rheinmetall," Düsseldorf	..	..
Thyssen & Co., Mülheim	..	11
Westfälische Stahlwerke, Bochum	..	9

The distance from Ruhrort to Dortmund being about 35 miles, it will be seen that the works are concentrated in a small area. The population of the Ruhr is 3,700,000, and there are 14 towns with more than 100,000 inhabitants. The total number of workmen is about 1,000,000, while the number of different companies in the Rhine Province and Westphalia district, excluding Siegerland, the Wetzlar area and the Saar, is approximately 57, with 124 blast furnaces and 411 converters and open-hearth furnaces. The latter have a capacity of 13,660 tons per day, and, in addition, there are 38 electric furnaces, with a capacity of 305 tons per day.

Canadian Iron and Steel in 1922

The production of pig iron in Canada during December was 35,891 gross tons, compared with 34,289 tons in November. The total production during 1922 was 383,057 tons as compared with an output of 594,354 tons in 1921, or a decrease for 1922 of 211,297 tons. The maximum production during 1922 was in March at 41,733 tons. The minimum output of 23,363 tons was in May.

The production of ferro-alloys was well maintained throughout the year, the total being 20,749 tons as compared with 22,493 tons in 1921.

During the last six months of 1922 there was a considerable improvement in the production of steel, when compared with the output of the first six months. The total steel production during the first six months was 177,080 tons, while 308,140 tons was produced during the last half. The year's output was 485,643 tons as compared with 645,075 tons in 1921.

The Newfoundland legislature has been prorogued until Feb. 28. Premier Squires is in Montreal conferring with owners of iron mines in Newfoundland due to a crisis arising from the French occupation of the Ruhr district of Germany. Cancellation by German buyers of ore contracts has forced the Newfoundland mines to close, thereby throwing 2500 workers out of employment.

CONTRACTS AWARDED

Blast Furnace and Other Units of Columbia Steel Corporation Plants Will Be Built

Plans for the expansion of the Columbia Steel Corporation, San Francisco, organized as stated in THE IRON AGE of Dec. 21, 1922, are to be carried out. The new corporation will acquire the properties of the old Columbia Steel Co., which manufactures steel castings, bars and billets in its plants at Pittsburg, Calif., and Portland, Ore. These properties will be extended to include wire and nail works, wire rod and sheet mills, and through the acquisition of coal, iron and limestone deposits in Utah, where a blast furnace and by-product coking plant will be constructed. Contracts have been awarded for all of the improvements. The mills will be constructed at Pittsburg, while the blast furnace and coke ovens are to be built at Provo, Utah. The furnace will have a capacity of from 350 to 400 tons daily. The by-product plant consisting of 33 ovens will be erected by the Koppers Co. as announced in THE IRON AGE of Jan. 25. Eventually it is planned to erect steel works in Utah also. Springville, Utah, a town near Provo, has given 400 acres, a mile north of the city, to the Columbia company as the site for a steel plant. Freyn, Brassert & Co., Chicago, have been appointed consulting engineers in charge of construction of the blast furnace at Provo.

Current American Shipbuilding

On Jan. 1, 1923, American shipyards were building or under contract to build for private shipowners 218 steel vessels of 251,858 gross tons, compared with 216 steel vessels of 257,328 gross tons on Dec. 1, 1922.

These figures do not include Government ships or ships building or contracted for by the United States Shipping Board.

Following is a summary of reports of shipyards to the Bureau of Navigation, Department of Commerce, showing the number and gross tonnage of steel vessels under construction or contract for private owners on Jan. 1, 1923:

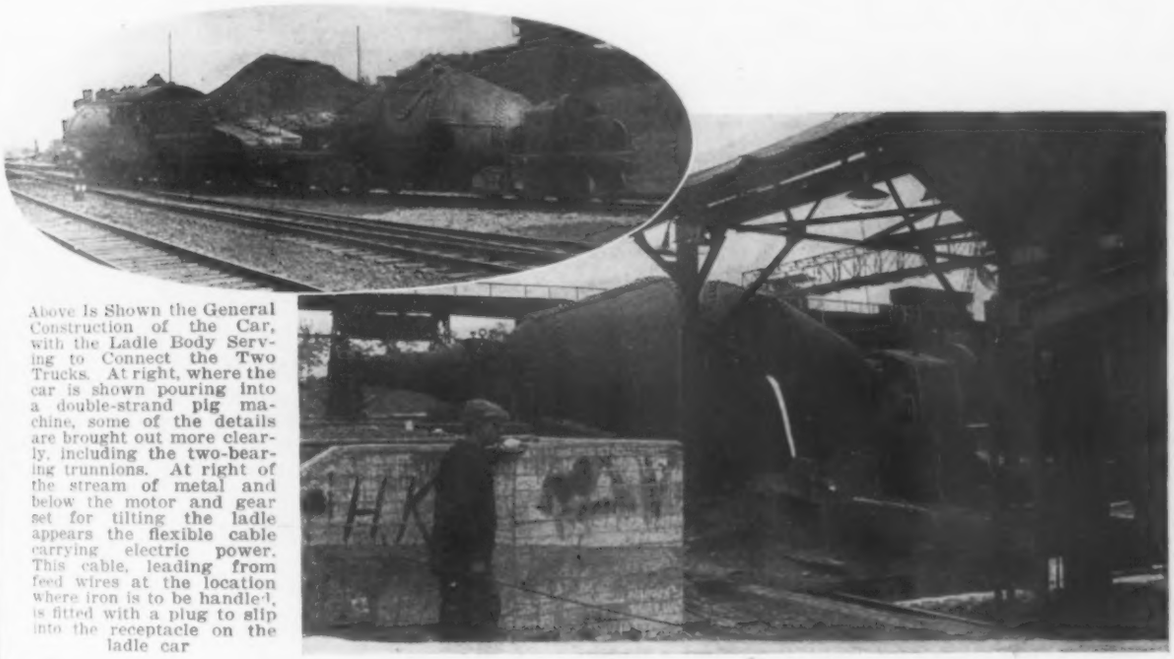
Companies	Number	Gross Tonnage
American Bridge Co., Ambridge, Pa.	83	37,840
American Car & Foundry Co., Wilmington, Del.	6	3,350
American Shipbuilding Co., Cleveland	6	46,100
Bath Iron Works, Bath, Me.	1	800
Bethlehem Shipbuilding Corp., Ltd.		
Baltimore Dry Dock Plant, Locust Point, Baltimore	1	920
Harlan Plant, Wilmington, Del.	5	2,376
Sparrows Point, Plant, Sparrows Point, Md.	4	4,200
Union Plant, Bethlehem, Pa.	4	29,682
Charles Ward Engineering Works, Charleston, W. Va.	2	420
Bravo Contracting Co., Pittsburgh	17	6,330
Dubuque Boat & Boiler Works, Dubuque, Iowa	1	125
Federal Shipbuilding Co., Newark, N. J.	6	15,000
Great Lakes Engineering Works, Ashtabula, Ohio	2	3,200
Great Lakes Engineering Works, River Rouge, Mich.	2	8,550
Howard Shipyards Co., Jeffersonville, Ind.	2	995
James Rees & Sons Co., Pittsburgh	1	175
Johnson Iron Works, Dry Dock & Shipbuilding Co., New Orleans	2	750
Kyle & Purdy, Inc., City Island, N. Y.	2	710
Los Angeles Shipbuilding & Dry Dock Corp., Los Angeles, Cal.	3	3,747
Manitowoc Shipbuilding Corp., Manitowoc, Wis.	1	175
Marietta Manufacturing Co., Point Pleasant, W. Va.	14	5,538
Nashville Bridge Co., Nashville, Tenn.	2	500
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.	2	13,000
New York Shipbuilding Corp., Camden, N. J.	5	18,690
The Pusey & Jones Co., Wilmington, Del.	6	7,740
Riter-Conley Co., Pittsburgh	10	9,000
Staten Island Shipbuilding Co., Mariners Harbor, N. Y.	6	2,738
Sun Shipbuilding Co., Chester, Pa.	12	14,150
Todd Dry Dock & Construction Corp., Tacoma, Wash.	1	3,000
Tebo Yacht Basin Co., Brooklyn	2	657
Toledo Shipbuilding Co., Toledo, Ohio	2	8,200
Wm. Cramp & Sons Ship & Engine Bldg. Co., Philadelphia	3	2,100
Union Construction Co., Oakland, Cal.	1	1,100
Total	218	251,858

MIXER TYPE HOT METAL CARS

Absence of Skulls, Low Cost of Maintenance and Preliminary Mixing Are Features

One of the annoying troubles incident to transferring molten iron from the blast furnace to either the steel works or the pig casting machine has long been the skulling of ladles. Scrap produced in this way has of course varied over a wide range, but it has always been large and in many cases has averaged as much as one day's production of iron per month. The inclosed type hot metal car developed under the Pugh patents by M. H. Treadwell Co., 140 Cedar Street, New York, is designed to overcome this skulling difficulty, and at the same time to accomplish other things.

First of these cars to be installed was one of 72 tons capacity, built for the Jones & Laughlin Steel Co., Pittsburgh, and delivered early in 1916. In 1919 this company purchased eight 81-ton capacity cars, making a complete hot metal car equipment for the Eliza furnace department. Seven or eight other steel companies have equipped themselves with mixer cars varying in capacity from 70 to 100 tons and a 125-ton capacity car now being built will be delivered to the St. Louis Coke & Chemical Co. early this year.



Above Is Shown the General Construction of the Car, with the Ladle Body Serving to Connect the Two Trucks. At right, where the car is shown pouring into a double-strand pig machine, some of the details are brought out more clearly, including the two-bearing trunnions. At right of the stream of metal and below the motor and gear set for tilting the ladle appears the flexible cable carrying electric power. This cable, leading from feed wires at the location where iron is to be handled, is fitted with a plug to slip into the receptacle on the ladle car

The container consists essentially of a cylinder with two conical ends. By this construction a carrying capacity is reached of several times the 20 or 30 or 40 tons of the old type ladles, without exceeding the height of those ladles. This makes it possible to use the new carriers without changing track elevations or locations of delivery spouts in the cast house.

The larger sizes take an entire blast furnace cast one car unit. This makes it possible to pour into a mixer without having to spot successive units at the mixer receiving hole. Skulling is minimized because of the relatively small radiating surface. There is a virtual mixing of the entire cast, a matter of importance, particularly in pouring into pig machines. By taking the blast furnace cast in one unit the cast house runners are shortened. The cast house itself, for future furnaces, can be shortened also.

Two types of car have been developed; in both cases the ladle body is designed for tilting in either direction, so that either right hand or left hand use may be had. The first type was tilted on two or more sets of trunnions by a crane in the usual manner and the second type, which includes most of the cars built, is a self-contained motor dump car. In the later type the ladle is carried on one pair of trunnions set on the center line and a motor operates the ladle through a train of gearing.

In the earlier type, designed for crane tilting, the car had a cast steel frame connecting the two trucks. In the later type, however, shown in the illustrations, which were taken at the plant of the Replogle Steel Co., Wharton, N. J., there is no car frame, the connection between the two trucks being by means of the ladle body centered upon its axis. The ladle body is made of heavy steel plates with from two to four rows of rivets, depending upon the seam involved, and the trunnions are steel castings, each trunnion having two journals or bearings. The massive bearing next the body takes the weight, while the outboard bearing merely takes care of the vertical component of the draw bar pull. The ladle and trunnions, however, are designed so that the entire car with the ladle filled with hot metal could be lifted by the outboard bearings of the trunnions.

The cars at Wharton have an over-all length of about 42 ft., and are carried on two 6-wheel trucks. The total weight when loaded is about 200 tons. The designed capacity was 100 tons, but, as the lining gradually wears down, as much as 115 tons of iron has been put into one ladle. More than 100,000 tons of iron, mostly foundry grades, have been handled by the two cars at Wharton, without any occasion for relining them and without making any scrap. It is estimated by the officials at that plant that the ladle should run from 60,000 to 75,000 tons each, between linings.

In another plant, where one of these cars was used to take the product of a blast furnace which had been banked for several weeks, the first iron was so sluggish that only a small portion of what went into the car could be poured. As a result, after two or three casts had been made, this ladle had a skull of 86,000 lb. The ladle was kept in continuous service and as soon as the furnace was running hot iron the skull began to disappear and after 20 consecutive casts the ladle showing a smaller light weight after each cast, the skull was gone and the inside of the ladle was clean.

The same property of melting iron is taken advantage of in regular practice by picking up all yard scrap and throwing it into the ladle. It is reported that even steel scrap, in limited quantities, has been handled by this means, particularly when it is thrown into an empty ladle and thus given a red heat before the molten iron hits it. The lining in the central portion of the ladle, where the falling stream from the blast furnace lands, is commonly made about 15 in. thick. Elsewhere in the body the thickness is 11 in. The cost of lining an 80-ton ladle is estimated at $200, which, on 60,000 tons per lining, would work out at about 1/3c. per ton, including material and labor.

Substantial Gain in Iron and Steel Exports

December Figures 22,388 Tons Above November—Best Month Since July—Structural Steel, Bars, Plates, Wire, Tin Plate and Pipe Lead

WASHINGTON, Jan. 30.—Registering an increase of 22,388 gross tons in December over November, exports of iron and steel in December totaled 150,170 tons, and for the calendar year 1922 aggregated 1,986,297 tons. The December value was $16,668,116 while the value for the year was $188,841,433. For December, 1921, exports amounted to 134,415 tons, valued at $14,718,476, and for the year 1921 they were 2,213,042 tons, valued at $323,666,732.

Machinery exports also showed a gain in December, being valued at $21,460,583, as compared with $19,839,716 in November, and $20,432,683 in December, 1921. For the year 1922, the value of machinery exports was $239,244,733, a sharp decline under 1921, when the value was $411,293,334. Machine tools exported in December totaled 3088, valued at $444,292, as compared with 1751, valued at $302,393, in November.

The first import figures under the new tariff act still remain to be compiled, having been further delayed, but it is now hoped to have them ready by the latter part of the present week. They will cover the period of Sept. 22 to Oct. 31, 1922, the former being the effective date of the new law.

The items of greatest exports of steel in December

Exports of Iron and Steel—Gross Tons

	December		Twelve Months Ending December	
	1921	1922	1921	1922
Pig iron	2,450	3,136	27,247	30,922
Ferromanganese	50	43	690	1,107
Ferrosilicon	50	196	368	689
Scrap	4,256	2,761	37,117	64,572
Ingots, blooms, billets, sheet bar, skelp	250	8,449	10,363	107,201
Iron and steel bars	14,911	14,123	200,933	173,075
Alloy steel bars*	.....	393	.....	4,416
Wire rods	3,338	1,498	18,506	40,424
Plates, iron and steel	8,336	11,300	335,857	100,984
Sheets, galvanized	3,936	6,634	55,990	109,320
Sheets, black steel	34,363	5,477	193,428	214,911
Sheets, black iron	419	989	12,414	11,69[illegible]
Hoops, bands, strip steel	1,639	3,756	20,280	34,511
Tin plate, terne plate, etc.	9,170	6,513	107,726	76,629
Structural shapes, plain material	9,422	17,516	297,022	136,943
Structural material, fabricated	38	5,076	9,570	47,223
Steel rails	14,943	17,481	322,107	279,105
Rail fastenings, switches, frogs, etc.	372	3,409	8,164	38,327
Boiler tubes, welded pipe and fittings	13,029	16,931	348,687	178,518
Cast iron pipe and fittings	1,525	3,019	48,523	28,227
Plain wire	5,787	7,459	69,335	112,970
Barbed wire and woven wire fencing	876	5,214	29,976	73,591
Wire cloth and screening*	.....	108	.....	1,526
Wire rope and cable	.....	379	.....	4,619
Wire nails	3,778	2,814	29,203	55,022
All other nails and tacks	316	607	4,692	8,384
Horseshoes	37	115	614	987
Bolts, nuts, rivets and washers, except track	1,124	1,564	24,230	18,097
Car wheels and axles†	.....	1,888	.....	17,508
Iron castings†	.....	955	.....	10,188
Steel castings†	.....	171	.....	2,210
Forgings†	.....	172	.....	2,171
Machine screws†	.....	24	.....	228
Total	134,415	150,170	2,213,042	1,986,297

*Not reported separately, prior to January, 1922.
†Previous to January, 1922, reported by value only.

Machine Tool Exports

	December, 1922		November, 1922	
	No.	Value	No.	Value
Lathes	124	$106,818	60	$41,123
Boring and drilling machines	239	79,386	137	57,670
Planers, shapers and slotters	16	28,169	17	19,975
Bending and power presses	23	20,146	28	12,417
Gear cutters	8	9,838	9	11,707
Milling machines	49	32,095	42	33,118
Sawing machines	21	3,507	16	3,573
Thread cutting and screw machines	293	29,977	248	34,926
Punching and shearing machines	33	8,670	13	2,848
Power hammers	22	11,974	13	11,820
Rolling machines	3	1,460	4	93
Wire-drawing machines	5	7,985	1	20
Polishing and burnishing machines	4	3,876	4	623
Sharpening and grinding machines	2,248	100,391	1,159	72,460
Total	3,088	$444,292	1,751	$302,393

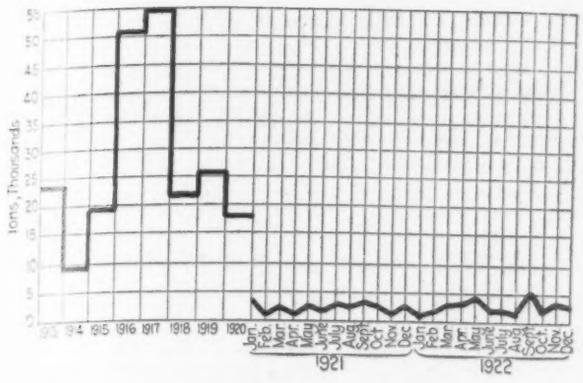
Following are the countries to which the principal tonnages of exports of leading steel products were sent in December, 1922, and the year:

	Gross Tons	
	December, 1922	Calendar Year 1922
Steel Rails		
Cuba	3,891	28,054
Japan	2,710	133,134
Philippine Islands	1,955	7,738
Colombia	1,383	12,020
Canada	423	23,294
Barbed Wire		
Argentina	892	16,071
West Indies	847	6,015
Brazil	692	13,055
Australia	584	8,598
Colombia	489	4,266
Tin Plate		
Japan	2,417	27,756
Canada	1,512	18,849
Argentina	992	3,318
Galvanized Sheets		
Argentina	2,716	19,476
Canada	1,367	16,006
Australia	739	11,697
Japan	291	31,944
Brazil	646	7,435
Black Steel Sheets		
Canada	4,105	41,226
Argentina	707	3,957
Japan	152	159,089

Exports, January, 1921, to December, 1922, Inclusive

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
*Average, 1912 to 1914	2,406,218	221,582	145,720
*Average, 1915 to 1918	5,295,333	438,462	1,468,026
Calendar year 1919	4,239,837	309,682	258,907
Fiscal year 1920	4,212,732	248,126	288,766
Calendar year 1920	4,961,851	217,958	216,873
January, 1921	547,394	3,710	315
February	393,328	1,307	92
March	230,635	2,320	1,022
April	162,592	1,234	678
May	142,551	2,541	749
June	119,081	1,689	1,106
Fiscal year 1921	4,168,619	129,541	82,549
July	86,523	2,744	363
August	75,827	2,424	2,447
September	95,169	3,078	1,318
October	106,582	2,830	153
November	125,511†	1,299	1,869
December	134,415	2,550	250
Calendar year 1921	2,213,042	28,305	10,362
January, 1922	160,920	1,043	4,682
February	133,975	1,430	6,627
March	208,843	2,724	10,002
April	198,830	2,750	9,376
May	230,062	3,897	13,091
June	212,295	1,996	13,178
Fiscal year 1922	1,721,418	28,330	63,127
July	157,169	1,943	10,149
August	145,640	1,791	9,353
September	129,475†	5,203	6,810
October	132,924	1,553	8,364
November	127,782	3,464	7,157
December	150,170	3,136	8,449
Calendar year 1922	1,986,297	30,922	107,201

*Calendar years. †Revised.



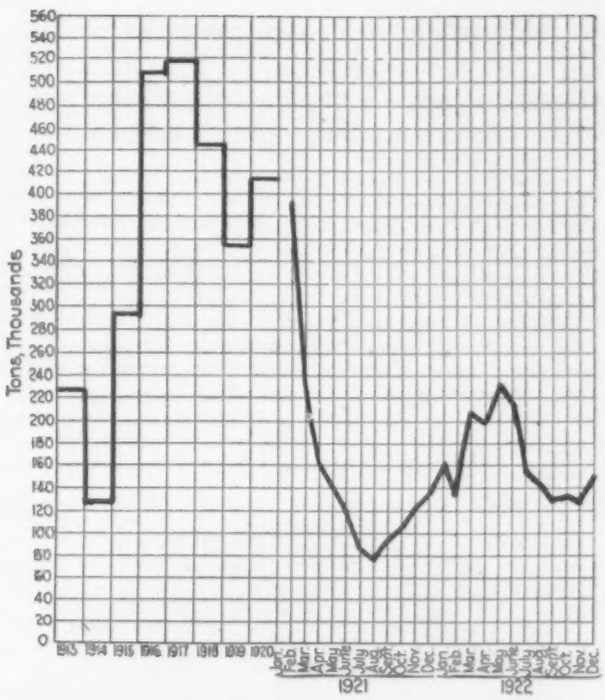
Monthly Exports of Pig Iron from United States. The horizontal lines at left show average month for each year. The curve at right shows the movement during 1921 and 1922

were plain structural material and rails, which ran closely together, the former amounting to 17,516 and the latter 17,481 tons, while boiler tubes and welded pipe exports totaled 16,931 tons. For the year 1922, steel rails were exported in greatest volume, the total being 279,105 tons, black steel sheets ranking second with a total of 214,911 tons. For both products Japan was by far the greatest market. That country took 133,134 tons (47.7 per cent) of steel rails and 159,089 tons (74 per cent) of the black steel sheets exported during the year. Japan also was the greatest export market for tin plate, taking 27,756 tons (36.2 per cent) and for galvanized sheets, taking 31,944 tons (29.2 per cent).

MACHINERY EXPORTS

By Value

	December, 1921	December, 1922	Twelve Months Ending December, 1921	Twelve Months Ending December, 1922
Locomotives	$2,178,620	$706,699	$33,696,331	$8,663,764
Other Steam Engines	106,784	164,605	1,821,008	2,329,001
Boilers	236,925	82,199	4,847,303	1,240,106
Accessories and Parts	.....	335,630	.....	3,135,823
Automobile Engines	275,109	275,532	1,821,120	5,132,754
Gas Engines	48,786	66,913	362,570	709,877
Stationary	35,179	217,244	2,090,669	1,844,814
Marine	42,063	69,446	1,406,291	883,416
Aircraft	.....	1,400	.....	72,819
Other Internal Combustion Engines	66,848	105,118	1,569,622	833,425
Accessories and Parts for	.....	210,738	.....	2,700,861
All Other Parts of Engines	415,561	.....	11,790,508	.....
Complete Tractors, except Agricultural	4,775	10,623	123,147	75,749
Electric Locomotives	.....	.....	2,120,712	.....
Other Electric Machinery and Apparatus	1,777,030	631,056	28,632,366	7,844,250
Excavating Machinery	37,997	.....	2,280,591	.....
Concrete Mixers	22,502	56,764	581,861	552,041
Road Making Machinery	53,878	.....	989,557	.....
Elevators and Elevator Machinery	54,622	.....	1,979,504	.....
Mining and Quarrying Machinery	742,405	642,794	18,870,257	6,570,734
Oil Well Machinery	393,349	.....	11,306,713	.....
Pumps	398,358	548,708	11,966,469	6,050,158
Lathes	120,001	106,818	2,977,689	776,874
Boring and Drilling Machines	.....	79,386	.....	608,044
Planers, Shapers and Slotters	.....	28,169	.....	295,939
Bending and Power Presses	.....	20,146	.....	313,529
Gear Cutters	.....	9,838	.....	114,363
Milling Machines	.....	32,095	.....	378,137
Sawing Machines	.....	3,507	.....	45,311
Thread Cutting and Screw Machines	.....	29,977	.....	212,412
Punching and Shearing Machines	.....	8,670	.....	146,141
Power Hammers	.....	11,974	.....	130,279
Rolling Machines	.....	1,460	.....	161,355
Wire-drawing Machines	.....	7,985	.....	20,387
Polishing and Burnishing Machines	.....	3,876	.....	17,417
Sharpening and Grinding Machines	63,088	100,391	1,215,280	826,698
Other Metal Working Machinery and Parts of	589,744	72,848	15,442,852	5,754,551
Textile Machinery	1,792,662	847,490	19,928,353	13,725,640
Sewing Machines	564,193	972,883	7,306,074	7,384,712
Shoe Machinery	112,338	116,880	1,797,094	1,052,908
Flour-Mill and Gristmill Machinery	69,206	170,569	1,612,066	1,207,426
Sugar-mill Machinery	214,981	260,565	15,628,253	3,798,628
Paper and Pulp Mill Machinery	412,563	.....	2,987,657	.....
Sawmill Machinery	9,795	50,945	1,029,383	600,058
Other Woodworking Machinery	93,357	153,883	2,514,745	1,443,433
Refrigerating and Ice Making Machinery	221,956	196,224	1,913,014	1,906,218
Air Compressors	152,262	184,076	3,905,684	2,217,515
Typewriters	872,061	1,237,964	12,431,397	11,573,970
Power Laundry Machinery	32,518	138,694	925,319	742,995
Typesetting Machines	225,675	292,900	3,511,455	3,827,732
Printing Presses	609,174	748,537	8,031,245	4,155,441
Agricultural Machinery and Implements	3,262,221	2,891,039	96,931,586	29,001,389
All Other Machinery and Parts	4,124,097	8,555,325	72,947,589	98,165,639
Total	$20,432,683	$21,460,583	$411,293,334	$239,244,733



Monthly Exports of All Iron and Steel from United States. The horizontal lines at left show, in each case, the average month of the year indicated. The curve at right shows the movement during the past 24 months

The iron and steel export movement in 1922 was considerably below the pre-war total; the average for the period 1912-1914 being 2,406,218 tons, and was essentially greatly below the war period of 1915-1918, when the average was 5,295,333 tons, and also below the subsequent years. The exports for the calendar year 1919 totaled 4,239,837 tons and for 1920 they were 4,961,851 tons.

How to check plans and specifications for safety is told in a pamphlet of the National Safety Council, 168 North Michigan Avenue, Chicago, which contains a check list of several hundred items to be considered if serious hazards are to be avoided. General plant layout, railroads, roadways for vehicles, foot ways, pipe lines, heating, ventilating, lighting, power supply and transmission, elevators, cranes and the layout of machinery are among the many subjects outlined in the pamphlet. For detailed information on each of the points given the engineer or architect is referred to the various standards and handbooks listed.

The Security Trust Co., Detroit, has been appointed receiver for the Liberty Motor Car Co., Detroit, in a friendly receivership action requested by the Parish Mfg. Co., Reading, Pa. The company has been hampered in its production by failure in deliveries of assembling materials. It is to be reorganized and refinanced and it is planned to utilize the excellent manufacturing facilities of the Liberty company.

"Modern By-Product Coking and the Koppers Company's New Combination Oven," a paper by Joseph Becker, read before the meeting of the Eastern States Blast Furnace and Coke Oven Association in Buffalo, Oct. 5, has been printed in booklet form, with illustrations. Mr. Becker is a consulting engineer of the Koppers Co., Pittsburgh, which is publishing the paper.

The average weekly wage of factory workers in New York State in December was $26.39, according to a statement by Industrial Commissioner Sayer. This is a gain of 35c. over November, 1922, and a gain of $1.48 since December, 1921. While the workers in practically all industries earned more, the metal trades led.

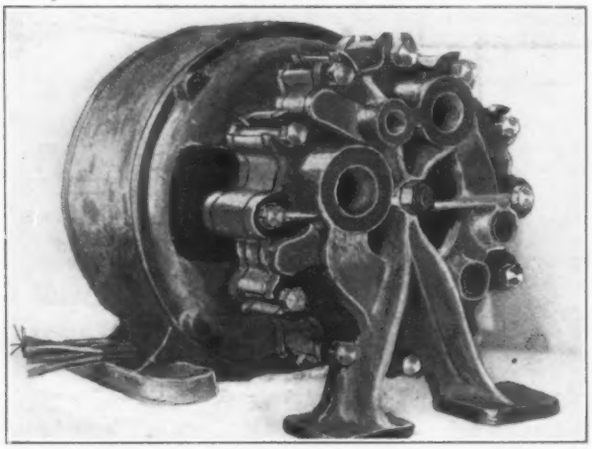
NEW ROTARY AIR COMPRESSOR

Rotor Design Unique—Low Compression Temperatures—Other Features

Few parts, practically isothermal compression and smooth running are features claimed for the rotary air compressor illustrated, a development of the Hill Engineering Co., Inc., 42 Broadway, New York.

Two simple rotors in a housing are the chief components of the machine. An analysis of the principles of design incorporated in the rotors is said to involve a field of geometry as yet substantially unexplored, and an explanation of the principles are promised in the near future.

The rotors are within a housing and are driven directly by the motor shaft. Two rotors are employed, one within the other as shown. They have



Hill Rotary Air Compressor with Motor Drive Is Shown Above. Low compression temperatures, four stages in one mechanical movement and freedom from friction are features claimed. The rotors are shown at the left

lobes and roll together, opening chambers to take in air and closing them to discharge it. The chambers are kept air tight automatically in order that there will be no air leak or slip between the rotors in case of wear. The two rotors run at speeds of eight to nine, a difference of one, and for nine turns of the driving shaft they turn on each other but once. This, it is pointed out, makes high speeds practicable. The rotors run between films of lubricant and the films are found to prevent air leakage over the sides of the rotors.

Because of having nine chambers, there is compression in stages, for the higher pressures four stages, each successive chamber between the intake and discharge ports having a higher pressure than the one before it. The liquid flowing through the rotors cools the air during compression by direct contact, which is said to make intercooling between the stages unnecessary, the liquid absorbing the heat of compression. After discharge, the air and liquid are separated in a separator provided, the liquid being cooled and returned under high pressure to repeat its function. For 150 lb. pressure, the discharge temperature is said to be not much over 100 deg. Fahr. It is further claimed that by this process the air may be washed.

Elimination of clearance in the rotor chambers is emphasized, thus favoring a high volumetric efficiency; low compression temperatures and the four stages of compression in one mechanical movement are offered as claims for high mechanical efficiency, and small power consumption.

In a test of one machine, 375 lb. air pressure is said to have been attained without pushing. The machine is available in capacities up to 7½ cu. ft. at 125 lb. It will be shown at the International Exposition of Inventions and Investments, to be held in New York, Feb. 16 to 23.

Refractories Subject of Meeting

Refractories, their manufacture, properties and use, were outlined by Kenneth Seaver, chief engineer Harbison-Walker Refractories Co., Pittsburgh, at a meeting of the Metropolitan Section of the American Society of Mechanical Engineers in New York, Jan 23.

A stereopticon was used to illustrate his talk, which embraced principally fire clay and silica brick. The mining and transporting of the clay to the wet pans, the molding and drying of the brick and the arrangement of the brick in the kilns were described and illustrated by slides. Silica brick and its significance in revolutionizing coke oven practice was brought out, and the process of manufacture from procuring raw material to removal of the finished brick from the kiln was outlined. A magnesite quarry and works was also shown.

Fusion point tests, thermal expansion of refractory brick, the influence of the addition of asbestos, Portland cement, lime and salt to fire clay brick, the crushing strength of silica brick at various temperatures and the relative conductivity of silica and fire clay brick were among other phases of the subject discussed by him. Various troubles in boiler arch construction and how they were corrected were shown.

The discussion which followed Mr. Seavers talk focused upon refractories as used in boiler firebox practice. Greater uniformity in the size of brick and the need for a brick that will lay up an even wall with a minimum of bonding material was brought out. The need of several standard specifications for bonding was also voiced. Mr. Seaver pointed out that the difficulty in getting brick of uniform size was because the layers of brick as piled in the kiln are subjected to a varying load, and that gaging and culling the brick would be expensive for commercial practice.

Dial Test Indicator Attachment

A dial test indicator attachment, No. 729, intended to add to the usefulness of the dial indicator by equipping it to test internal and other surfaces not conveniently reached by the regular straight spindle of the dial indicator, has been placed on the market by the Brown & Sharpe Mfg. Co., Providence.

The construction may be noted from the illustration. Ease of attachment and the making of direct contact

Dial Test Indicator Attachment to Permit Testing Internal Surfaces

between the test bar and the dial plunger are emphasized as time saving features and, no adjustments being made, this eliminates chance of inaccuracies. The arm is a bronze casting. The test bar is of ground steel, accurately balanced and held firm by a pin through the center of the arm.

Israel Joseph, scrap dealer, Aurora, Ill., has purchased the Chicago, Aurora & DeKalb Electric Railroad for $90,000 at a mortgage foreclosure sale. The road is 31 miles in length extending between Aurora and DeKalb. The purchaser is undecided as to whether he will junk the line or operate it.

STRIKERS RESENTFUL

Men Embittered by Action of Union in Connellsville Region

UNIONTOWN, PA., Jan. 29.—Official abandonment by the United Mine Workers of America of the strike in the Connellsville coke region has brought about the keenest resentment on the part of the strikers who have been left to their own resources. There is a definite movement on the part of some of these men toward the organization of an independent union not to affiliate with the U. M. W. A. and eventually, if their hopes are realized, to extend throughout the State. Many of the strikers behind the insurgent movement declare that the rank and file of the union workers in the country, and especially District No. 5, are supporting the men in the coke region and will continue to give them financial support despite the action of the international union in withdrawing from the strike. Three meetings already have been held in the region, two at New Salem and one at Brownsville, at which the insurgent movement has been discussed. At the Brownsville meeting a telegram was read from John L. Lewis, head of the U. M. W. A., confirming the reports submitted at the convention last week that the strike had been officially declared off.

Reports of activities of radical agents, representing the I. W. W., Communists or similar organizations, have been received by various police authorities in the region and a rigid investigation is under way. Several Department of Justice agents are in the region investigating.

Operators in the coke region will not deal with any insurgent or independent organization. The strike in the Connellsville region long since has ceased from the viewpoint of production. Strikers have been taken back to work at the plants wherever vacancies existed which they could fill. This method of procedure still exists, and since the official abandonment of the strike scores of men have returned to their old places in the mines. Others are still holding out in the hope that something may come of the insurgent movement. Observers point out that hopes along this line are just as futile as were hopes for the unionization of the Connellsville coke region.

Strikers returning are to be taken back entirely on the status of new employees. Their past records have no bearing on the situation and they are given no preference over men who have come into the region and have made possible the operation during the past several months.

The car situation is the one factor that is developing any serious situation in the region—and this is becoming acute. Operators are unable to understand the reason for such a condition, especially in view of the mild winter. Promises of railroad companies for improvement in car placements have been about as fruitful as the promises held out by the United Mine Workers to their "victims" in the coke region. Coke car placements have been better than coal car placements, these running up to around 70 per cent. Coal car placements, however, will not exceed 10 per cent on an average for the past week.

Coke production in the region for the week ending Jan. 20 was 234,680 tons. Nine hundred and twenty-two additional ovens were put in operation during the week. Additional ovens were fired at four W. J. Rainey, Inc., plants. The Buffington plant of the Frick company, idle since the strike began, was put in operation.

LABOR RELIEF NOT PROBABLE

Legislation on Immigration Not Likely to Pass at This Session

WASHINGTON, Jan. 30.—Legislation on immigration at this session of Congress is altogether improbable. While hearings have been held and additional ones are to be conducted, they are largely of a formal character and are accepted chiefly as placing on record the position of those advocating respective policies as to immigration. It may be stated as a foregone conclusion, therefore, that the iron and steel and other industries which are suffering from a shortage of labor will get no relief through increased immigration during the present year at least, if at all. As a matter of fact, the attitude of Congress tends to more restrictive immigration rather than a relaxation of the present 3 per cent law. Indicative of this is the fact that the House Committee on Immigration is about to report the bill of Chairman Johnson, providing reduction in the percentage quotas now allowed on the basis of 1910 from 3 per cent to 2 per cent, based on the population of 1890, countries excluded from the provisions being Canada, Mexico, Central and South American countries. The year for fixing the immigration quotas is the same as that provided by Senator Reed of Pennsylvania in his bill, but the latter increases the percentage.

At the same time, there is to be taken into consideration the fact that the American Farm Bureau Federation is in complete accord with the program of the National Association of Manufacturers, whose immigration program is incorporated in a bill by Senator Colt of Rhode Island, providing that emigration of a particular nationality from the United States shall be taken into account in computing quotas and also that the Secretary of Labor shall have authority to admit immigrants in excess of quotas to relieve labor shortages. The fact that the farm bloc will be increasingly powerful at the next session of Congress may prove a helpful element in furthering this program, although the vigorous position of organized labor likewise is to be reckoned with and reflects what is believed to be an inevitable clash within the so-called progressive bloc consisting of members who profess to represent the interests of farmers and organized labor. A hearing on the Colt bill will be held in the near future before the Senate Committee on Immigration.

During the past week hearing was held before the committee on the bill of Senator Reed of Pennsylvania, increasing the quota percentage from 3 to 5 and changing the basis from the census of 1910 to that of 1890. The chief witness was W. W. Husband, Commissioner General of Immigration of the Department of Labor, who expressed doubt as to the desirability of relaxing immigration restrictions in such a way as to relieve the shortage of common labor. Mr. Husband did not take a definite position on the subject, and did not go on record for or against the Reed bill. He intimated, however, that the plea of manufacturers for liberalizing immigration laws is not well taken.

Senator Sterling of South Dakota asked Mr. Husband if he was acquainted with the claim of the iron and steel industry that it has a shortage of 40 per cent in common labor.

"Yes," replied Mr. Husband, "I am also aware of the fact that there is a surplus of probably 250,000 workers in the bituminous coal industry.

"Before the war there were two workers available for every job. A finding to this effect was made by the Congressional Commission of which Senator Dillingham was chairman. During the war we developed our industries in spite of the cutting off of immigration and in spite of the fact that 4,000,000 of our men were put in uniform."

Mr. Husband said, regarding the Reed bill, that by using the census of 1890 as a basis, immigration from Southern Europe would be first restricted, while it would increase the quotas from Northern European countries. Senator Reed in defining his bill said it would stimulate immigration of the more desirable classes from Northern Europe. It was brought out that most of the Northern European immigrants are skilled workers and would furnish but little common labor. Senator Willis of Ohio pointed out that the Reed bill did not seem to offer any relief to industries which are seeking common labor.

GERMAN STEEL MOUNTS RAPIDLY

Nominal Advance of 42 Per Cent for Steel and 71 Per Cent for Foundry Iron, in Six Days

(By Radiogram)

WILMERSDORF, BERLIN, GERMANY, Jan. 29.—Foundry iron No. 1 has been advanced to 332,600 m. per metric ton ($8.45 per gross ton, at ¼c. per 100 m.), compared with 194,900 m. ($9.90, at ½c. exchange) last week and 194,900 m. ($14.45, at 0.73c.) two weeks ago.

Steel ingot prices have been raised by the Stahlbund to 417,000 m. ($10.59), compared with 293,900 m. ($14.93) last week and 240,800 m. ($17.85) two weeks ago. Steel bars have been pegged at 576,000 m. (0.65c. per lb.), compared with 406,000 m. (0.92c. per lb.) last week and 328,000 m. (1.09c. per lb.) two weeks ago. Thin steel sheets have been advanced to 898,000 m. (1.02c. per lb.), compared with 632,900 m. (1.44c. per lb.) last week and 497,000 m. (1.65c. per lb.) two weeks ago.

[Percentages of increase, as expressed in marks and compared with two weeks ago, are 70.7 for foundry iron, 73.2 for steel ingots, 75.6 for steel bars and 80.7 for thin steel sheets. Due to rapidly falling exchange rates, however, the "world" or gold prices have dropped sharply in the past two weeks. The decline in foundry iron, as expressed in gold, is 41.5 per cent; in steel ingots, 40.7 per cent; in steel bars, 40 per cent; in thin steel sheets, 38.2 per cent.]

RUHR STEEL AND GERMAN EXPORTS

Great Britain Rather Than United States Will Increase Shipments

The effect of the Ruhr occupation on the foreign trade of Great Britain and the United States in iron and steel may be judged in part from an analysis of Germany's steel export trade. To Nov. 1 Germany had exported steel and iron at the rate of 213,500 tons per month. Taking the September exports as representative of the whole 10 months' movement, about 50 per cent went to Europe, 12 per cent to Japan, India and other Asiatic countries, 10 per cent to South America and the remainder to "other countries." Since the Ruhr produces a very large percentage of Germany's total output and assuming that the French occupation will seriously cut down this production, then those countries which have been depending on Germany must turn to other exporting nations.

Some reports have exaggerated the possible benefit to American export trade due to the Ruhr situation. Considerable inquiry has already come to this country, but in view of the strong domestic demand little steel is available for export. Countries that have been buying from Germany will turn to England to no small extent and some plants there that have had little to do may now expand their operations. Belgian steel works are unaffected thus far by the Ruhr investment, but it is a question how much they can take on in addition to their present obligations. In France, Lorraine works have been crippled by the cutting off of Ruhr coal and it is a question whether France can function to any increased extent for some time in supplying steel to other countries. Luxemburg operations also, according to late cable advices, are curtailed.

Predictions that the United States, in view of continued restriction on steel production on the European Continent, will now be able to build up our much reduced steel export trade overlook the fact that with the present labor shortage it will be impossible to increase domestic output above the present rate, while in addition to the labor situation there is car shortage and in some districts continued freight congestion.

German Prices Rising Rapidly Under Occupation

BERLIN, GERMANY, Jan. 15.—The whole situation in Germany is at present overshadowed by the occupation of Essen. The Coal Syndicate has removed to Hamburg, but the contracts with mines are still running. Though the present syndicate terminates on March 31, a new one must be formed according to law, and trouble might only occur if the supply of coal from the Ruhr Valley to the other parts of Germany is stopped. In this case the import of coal would have to be increased. The mines at Essen belong to the large German concerns of Lothringen, Stumm, Hoesch, Rheinstahl, Krupp and Stinnes, and their output is about 10 per cent of the coal production of the Rhenish-Westphalian district and more than 6 per cent of the whole German production. Among the industrial undertakings Krupp with its 54,000 workmen is predominating. Some of the principal works in other lines are the Goldschmidt Chemical Works, Dinnendahl Engineering Works, and the Phoenix mining and iron operations.

German prices are rising rapidly and the average wholesale price index of the *Frankfurter Zeitung* for 98 commodities shows an increase from 167,412 (1914 figure taken as hundred) in December to 205,417 at the beginning of January. On the average coal prices have been increased by 50 per cent, for the Ruhr district by 67.7 per cent. Iron and steel prices which had been advanced by about 16 per cent on Jan. 10 were again raised on Jan. 12, and are now as follows in marks per metric ton:

	Marks
Ingots	257,000
Blooms	286,100
Billets	303,700
Sheet bars	312,400
Structural shapes	351,800
Bar iron	355,000
Universal iron	384,400
Hoop iron	425,800
Wire rods	379,300
Sheets, No. 6 and lower (U. S. A. gage)	400,400
Sheets, Nos. 6 to 11	450,200
Plates, Nos. 11 to 20	513,000
Plates, No. 20 and higher	553,400

[As indicated in our Berlin radiogram above, the above prices have risen rapidly since Jan. 15.—EDITOR.]

Five large works in the iron and steel industry—the Hasper Iron & Steel Works, the Königsborn Co., the Georg-Marie Mining & Iron Works, the Düsseldorf Iron & Wire Works, and the rolling mill of L. Mannstaedt—are taken over by the Lothringen Hütten and Bergwerks Verein Gesellschaft of the Klöckner concern. These works have been in "interessen gemeinschaft" for a number of years. During this time Lothringen has acquired the majority in the other works and the present transaction is only a matter of rounding out the organization of the Klöckner concern.

The Rheinische Automobilbau Gesellschaft, Düsseldorf, and the Automobilbau Gesellschaft Mannheim have been merged.

Pig iron prices on Jan. 8 were as follows in marks per metric ton:

Hematite	181,200
Foundry iron No. 1	179,400
Foundry iron No. 3	179,000
Foundry iron, Luxemburg	169,000
Spiegeleisen, 8 to 10 per cent Mn	236,300
Malleable pig iron	175,700
Steel-making iron, poor in copper	181,200
Ferrosilicon, 10 per cent	218,000
Siegerland steel-making iron	215,200

According to the estimate of K. Y. Kwong, Chinese engineer and mining authority, China's annual production of pig iron is placed at about 450,000 tons from Chinese furnaces and 250,000 from Japanese furnaces in China. The total output of iron ore in China is given as about 2,000,000 tons per year.

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Open Market Helped Steel Buying

The buying movement in finished steel products in the past two months is unusual in that it was not preceded by a period of decreased mill operation, with a liquidation in prices. Before the war the steel market moved in long swings. When prices once started to decline they did not stop until there had been a thorough shaking out. With astonishing patience buyers would wait for "the bottom," and meanwhile steel mill operations would decrease to a low rate. The present buying movement, on the other hand, is practically superimposed on the previous movement. Market prices receded only in that premiums for prompt shipment disappeared.

The fact that this movement in steel differs in important respects from its predecessors has not escaped attention. The point has been noted particularly by those who last October were predicting that there would be a general and decided decline in steel prices before an active market would again appear. They based their prediction upon experience in the steel market. But a new set of influences has been at work.

Conditions in the coal industry have been an important factor. The termination of the coal strike explained the disappearance of delivery premiums in steel products and furnished a reason why buyers did not need to expect that basis prices, for extended delivery, would follow in the decline. Then there was fear that there would be another coal strike next April, and buyers were naturally moved to cover for deliveries up to that time. Their theory might be that prices were certain to decline eventually, but if so they could reasonably assume that the decline would hardly occur until the new coal strike should pass out of the reckoning. The coal strike matter has disappeared in the past few weeks as a factor, but the buying movement had got its start and that, evidently, was all that was needed.

In regard to the comparison between steel market conditions now and before the war, another factor should not be ignored—that there is now a more open market than formerly. At no time since the War Industries Board's prices disappeared have there been steel prices commanding the respect that used to be accorded to market prices. It may be incorrect to say that before the war there were "controlled prices" in the steel industry, but it is certainly correct to assert that in most finished steel lines a price once established was regarded as an important thing, and a departure from it an event. Accordingly, if one decline occurred buyers expected more to follow, until a general liquidation should have been completed. With perhaps an occasional exception, the buyer was right.

Nowadays no such rule is followed. Before the war it was the practice to sell steel products on "contract" and the contracts sometimes extended far ahead. Mills sustained prices to induce specifying against contracts and when contracts became unproductive the drop not infrequently was sudden. Now the consumers have more frequent recourse to the mill, the market rests more directly upon demand and supply, and buyers have been less afraid of sudden drops. They have had more confidence in the market.

Overdoing Public Work

The agitation in favor of a constitutional amendment which would prohibit the issuing of tax exempt securities by States and other political subdivisions brings to general attention the fact that the making of public improvements, based on such borrowings, has been and is on a particularly large scale. Those who advocate making these securities taxable the same as privately issued bonds insist, as a matter of fact, that this activity in public improvements is going altogether too far.

Many economists have insisted that the chief cause of industrial depressions in the past has been the placing of too much liquid capital in permanent investments, while all admit that this is an important influence. If we say that extravagance naturally brings trouble, then extravagance along the line of creating things with small or no earning power, like public buildings, or things of questionable earning power, like public roads that may wear out sooner than expected or involve more upkeep expense than anticipated, is particularly objectionable.

If, on the other hand, we take it that depressions result from industrial enterprises being un-

able to earn what they were expected to earn, through too rapid expansion, then the case appears quite different. The late James M. Swank, who certainly had no personal bias against the iron industry, asserted in one of his annual reviews during the depression of 1873-8, that the depression was due largely to the land grant railroad policy of Congress, which caused the building of more iron mills and equipment shops than were permanently needed, whereby their earning power was lost. In the 1893-8 depression there was likewise an inability to earn, through facilities being too great for the existing circumstances. Railroad receiverships were the rule. The roads were not earning the money they had been expected to earn.

From one aspect, then, public improvements are especially dangerous because they represent an extreme of extravagance, while from another viewpoint they are harmless because, not being expected to pay dividends, their failure to do so disappoints no one. They do not involve receiverships or foreclosures, producing a panic.

The early part of an industrial depression is marked by widespread unemployment of labor, plainly due to a sudden curtailment in construction work, while common every-day activities insist on continuing as well as they can with the great restrictive influence of the reduced buying power of the public. Later phases of an industrial depression are full employment and painstaking work, with economy. New facilities are created in expectation of their developing good earning power in future years. The pig iron statistics of the 1893-8 depression illustrate this, production being at 35 per cent greater rate in 1897 and 1898 than in 1893 to 1896 inclusive, although the whole period passed into history as one of "depression."

Going back to the criticism of too much public work, it is to be noted also that some observers believe that the people are spending too much money on automobiles, moving pictures and dwelling houses. Such expenditures do not menace the future except as they may be made with borrowed money that cannot be repaid. In all these matters, including indulgence in public improvements, if there are economic ills, we are suffering them now rather than storing them up for the future. We still have time to get on a proper basis.

The importance which duraluminum may attain as a metal for structural purposes was emphasized in an address by Dr. G. K. Burgess of the Bureau of Standards at the recent annual meeting of the American Society of Civil Engineers in New York. This alloy after heat treatment has been shown to have a "strength efficiency," which is the strength divided by the weight, of some 20 per cent over alloy steel and 170 per cent over mild steel. The actual figures are 19,250 as against 7050 for mild steel and 16,000 for alloy steel. Doctor Burgess questioned whether a "new or fifth epoch may not be looked for in structural metals," that of aluminum alloys. The Bureau of Standards is now testing 143 duraluminum girders for the new navy dirigible ZR-1 with the result of added confidence in their adequacy and in the possibility of lighter construction in future design. Other factors to be considered are the low modulus of elasticity of such an alloy, only one-third that of steel; the greater rigidity, and the elimination of the need for painting. While the use of light aluminum alloys to replace steels in important permanent structures is "still in the conjectural stage," there is undoubtedly a promising immediate future for their use in other directions.

Public Service and the Engineer

Five engineers constitute the personnel of a rapid transit commission brought into being at Detroit. Engineers as such will take satisfaction in the appointment. Formerly these engineers would have been employed as members of the staff, but here is public recognition that technical ability and executive ability may be found in the same man. There is a tendency for engineers to think of themselves as representing a quality of mind not possessed by others. It is true they are not so bound by tradition as are many other members of the community and they think in terms of the future as well as the present, in a day of industrial marvels. Also they are growing numerically strong, for the broadening range of engineering undertakings has held out promising opportunities, and the conspicuous successes the best brains have won in industrial life and in public places have brought high credit to the profession. Promotion activities like those of the Federated American Engineering Societies have done their part in bringing such recognition and so has the equipment the average engineer now brings to his task.

Virginia Iron Circumscribed

After an enforced idleness of nearly two years, Virginia blast furnaces, with a partial resumption of operation, face a situation that is disturbing to their owners. There was a time when many eastern foundrymen, particularly those in New England, felt that a percentage of Virginia iron in their mixtures was almost a necessity. For more than a year no Virginia iron was to be had; all the furnaces were idle and their stocks had been exhausted. Thus foundrymen were forced to prepare new mixtures and to a certain extent they have learned to get along without Virginia irons. The reputation of these irons still exists, but when there is a difference of $2 or $3 a ton in the delivered prices as compared with Buffalo, eastern Pennsylvania or foreign iron, it has become more difficult for the makers to regain their old footing.

A large part of the Virginia pig iron output, which in good years has been over 500,000 tons, has always been sold at considerable distances from home, and apparently this condition will continue, as the region in which this iron is made has developed few important metal working operations. When railroad freight rates were on a generally lower basis the Virginia furnaces could ship into New England or into Pennsylvania or New York without much quibbling by consumers

over the slightly higher price. Today, based on $27 per ton at Virginia furnaces, the price of No. 2 plain iron delivered at Philadelphia is now $32.17, the freight rate being $5.17, whereas eastern Pennsylvania iron of the same grade can be delivered at Philadelphia around $29.

The resumption of activity in the Virginia district dates from the fall of 1922, and today four of the 16 furnaces are active, but a comparatively small part of their output has been sold, notwithstanding the general buying activity of the past month or two. For relief from the situation that has been gradually tightening upon them the Virginia iron makers have appealed repeatedly to the railroads, seeking freight rates that would permit them to compete in their accustomed markets. The Norfolk & Western and the Chesapeake & Ohio, the roads which tap the Virginia iron district, were understood some months ago to have agreed to put into effect such reductions, subject to the approval of the Interstate Commerce Commission, but the latter for some reason has withheld action up to this time.

The "Living Wage" in Kansas

The Supreme Court of Kansas, in upholding the decision of the State Court of Industrial Relations in the case of a dispute between a packing house and its employees, has laid down the principle that because the company for any reason might be operating at a loss it might not shift the burden of that loss to its employees by paying them less than a standard wage fixed by that court. Says the decision: "If the plant cannot operate when paying a living wage, it is only a question of a short time until it must stop. If the plant is badly located on account of transportation to its market or from the source of supply of its raw material, it ought to be moved to where these handicaps will not exist. If the loss is caused by managerial faults, they ought to be corrected. Recoupment of losses caused by any of these matters ought not to be brought about by compelling the workingmen to labor for less than a living wage."

The decision establishes no legal precedent under existing statutes of other States, for it is rendered under the Industrial Relations Act of Kansas, and no other commonwealth has a law like it. But it comes at a time when legislation of a similar character is proposed in a number of States and bears a certain relation to the widespread discussion of minimum wage and compulsory arbitration laws, which have strong opponents as well as proponents. In Kansas any group of employees may appeal to the Court of Industrial Relations for a readjustment of their hours and wages, and the tribunal hears the evidence and renders a decision by which owners, and presumably employees, must abide, excepting, of course, that no employee is compelled to keep his job if he wishes to seek advancement elsewhere. In a sense, the statute seeks to usurp the economic law of supply and demand. Kansas is a farming and not a manufacturing State; it has no large number of industries. Such an act in one of the great manufacturing States would create a task of adjudication so stupendous as wellnigh to bring on chaos.

Never have hours and wages responded more quickly to the law of supply and demand than in the last decade, and they have borne a close relation to the cost of living, with the margin generally in the worker's favor in the past seven or eight years. With business in flood tide wages go up and annual earnings ascend still higher because opportunity to work is more nearly constant. Labor is a more fluid commodity than it used to be. The manufacturing village, once so cut off from the world that its workers could only accept what was offered them in hours and wages, is no longer isolated. Should the wage scale of a plant anywhere be too low the workers go where they can command a better price for their skill and industry.

Wise laws may be created to govern working hours of women and children, and other safeguards may be placed upon employment by legislative enactment. But too great effort at artificial control of the labor market has its menace to the worker as well as to the owner. In the Kansas case the men and women involved in the decision might suffer more if the packing houses were compelled to go out of business or move elsewhere, as the court suggested, than if they had accepted the wages offered before the order of the court and then used their own initiative to find more profitable employment.

Organized labor is no respecter of institutions, even of one serving its own ends. The international labor office of the League of Nations, Geneva, Switzerland, announces that owing to a strike in the establishment where its bulletins and reports are printed appearance of further publications will be delayed.

Government Sales of Surplus Property

A sale of surplus Government property will be conducted under the direction of the Central Surplus Property Control Officer, 1819 Pershing Road, Chicago, on Feb. 9, at the General Intermediate Depot, Chicago. Included in the sale is hardware, machinery, and engineer property. The lots, which will be offered by Michael Tauber & Co., official auctioneer, Chicago, comprise drills, hammers, pickaxes, jacks, pipes and fittings, valves, pliers, clamps, saws, potentio-meters, ammeters, small electrical equipment, files, vises, snips, stoves, engines, etc. A Beatty steam crane, 7½ tons capacity, double truck, equipped with air and hand brakes and MCB couplers will be offered. A small lot of aluminum and zinc will also be offered.

Future sales of surplus property are announced for Feb. 13, at Jeffersonville, Ind.; Feb. 16, at Columbus, Ohio; Feb. 20, at Philadelphia, Pa.; Feb. 23, at Schenectady, N. Y.; and Feb. 27, at Boston, Mass.

What is known as the Fourth Commercial Fair will be held in the city of Brussels, Belgium, April 9 to 25. It will be a broad industrial exposition with exhibits of a wide variety, but including metal-working machines and metals and automobiles, electrical machinery, materials of construction, instruments of precision and agricultural machinery. The office of the exposition is 19 Grand Place, Brussels, but information may be obtained from Belgian consular agents in the United States.

CORRESPONDENCE

A Bonus to Reduce Absenteeism

To the Editor: In your issue of Jan. 18, page 235, you have an editorial on "Dealing with Absenteeism". We may say that we have instituted this week the plan of paying a bonus equal to 5 per cent of his wages to each workman who has not been absent or tardy during the week. We understand this system has been tried in Springfield. The theory is that a man who is not absent is worth more than a man who is frequently absent. The man who is absent demoralizes the general plan of work to some extent..

Of course, 5 per cent is not much. If a man is getting $30 a week, his 5 per cent would be only $1.50. But the loss of the $1.50 is immediate and obvious and, other things being equal, may influence the workman to be present at his place in the shop. Besides, there is a kind of moral issue involved. The workman is brought to feel, rather than see, that he is in duty bound to be present if he can, also that he is not the best kind of man for the place if he is absent. Moreover if the man who is present regularly is worth 5 per cent more than the man who is absent frequently, the latter may be the man to go when work becomes slack.

EVER-READY CAN CO.,
Greenfield, Ohio, Jan. 23. By E. L. Arnott.

The Indictment of Benedict Crowell

To the Editor: The wholesale indictment of business men in recent years has amounted to a travesty of justice in many cases and a proceeding which bears every appearance of injustice is the recent indictment of Benedict Crowell, Assistant Secretary of War during the world war, on charges of dishonesty in connection with awards of contracts during his service at Washington. It too often happens that in a sort of drag-net investigation, the order goes out to "get" somebody and one or more are "gotten" without full regard for evidence. The cases are allowed to drag along for an indefinite period, and even when a defendant is finally discharged his reputation is likely to be besmirched and the proceedings recalled to his embarrassment in future years when the facts, to a large extent, have been forgotten except by the ill disposed.

For many years Benedict Crowell was a chemist of the highest standard in Cleveland and his work and word were accepted without question by the iron ore companies, which entrusted to him analysis of ore upon which depended prices for many millions of tons. In later years, Mr. Crowell became connected with other business enterprises and there never was the slightest suspicion in regard to his integrity. At the beginning of the war, before the United States entered, he became a member of the Officers' Reserve Corps in 1916, and began his work of helping in the service of preparation for war. His efficiency was soon recognized and he was rapidly promoted until in November, 1917, he became Assistant Secretary of War. In that position, although it was a time of much criticism of the War Department, he stood out as one who rendered service of great importance in helping America to do its best.

Several years after his return from public service, and without giving him the slightest intimation that any charge of improper conduct was even being considered, and without giving him or any of his friends any opportunity to be heard, the indictment was found and published broadcast. Mr. Crowell's statement is characteristically modest:

> The fact is that I never profited one cent by the trust imposed in me by the country. No such conspiracy did or could have existed. It is not in human nature that a man, given the opportunities for service that were given to me in the time of the country's need, could have devoted those two years in cold blood to cheating and wounding the nation for his own miserable profit.
>
> The personal wrong to me is comparatively unimportant, but the wrong done to the country in detracting from the great national achievement of 1918 is not unimportant, and to publish to the world the false charge that the United States in that critical year placed the direction of the supply of its army in the hands of a traitor and a cheat is a wrong done to every citizen.

As one who has rendered long and honorable service to the iron business and to his country, Mr. Crowell is entitled to a prompt hearing, which we believe will bring a full vindication. FOR THE PUBLIC GOOD.

Larger Membership for the American Foundrymen's Association

To the Editor: The American Foundrymen's Association has been most modest in the matter of urging the foundrymen of the United States to support its work by taking membership in it. Engineering societies appeal to a sense of professional obligation and employers' associations generally urge the benefits to be had from standing together. The American Foundrymen's Association can make an engineering appeal to only a limited extent. It does not deal with labor questions, hence it does not seek firm and company members. Its memberships are individual. In its own way and through the vicissitudes of the foundry business in more than 25 years, it has worked, among other things, for higher standards of practice in foundry operations, for greater intelligence in the melting of cast iron and greater regularity and certainty in the production of castings. Its officers have worked zealously for these ends and its official places have been occupied, with few exceptions, by men who have made a success of their own work and who have had an ambition to realize greater things for their industry and for the organization.

C. R. Messinger of Milwaukee, who was chosen president at the Rochester convention last year, has taken a special interest in increasing the membership. He has made the board of directors as a whole a committee on bringing in the largest possible number of new members. In view of the excellent record of the association, its conspicuous service in the war period and since, and the number of foundry owners, superintendents and other executives who have been benefited by it without belonging to it, Mr. Messinger's expectation that the effort now being put forth should result in many additions to the membership is an entirely reasonable one.

A brief statement and exhortation under the title "What Do You Know About the American Foundrymen's Association?" has been widely circulated among non-members, and the secretary, C. E. Hoyt, 140 South Dearborn Street, Chicago, should be able, as the result of this and the other propaganda of the board of directors to go to the Cleveland convention in April with a much larger figure than 1650, which has been the average in recent years.

At a time when the making of a profit in the foundry is harder than ever, due to the new conditions faced in every industry, the work of an association like the A. F. A., which definitely aims to show foundrymen how to make a dollar or to save a dollar, should find its best support. A strong association means a strong industry. F. A.

Republic Iron & Steel Co. to Increase By-Products Plant

The Republic Iron & Steel Co., Youngstown, Ohio, has just placed a contract with the Koppers Co., Pittsburgh, for 61 of the new type combination ovens of that company. This is an addition to the present by-product coke plant of the Republic Iron & Steel Co., consisting of 143 Koppers ovens. The new ovens will have a carbonizing capacity of 1830 tons of coal per day, yielding 1281 tons per day of metallurgical coke, and together with the product of the present ovens will make the company self-contained in the matter of coke supplies as far as its Youngstown blast furnaces are concerned. The Republic Iron & Steel Co. has seven furnaces in the Youngstown district, having started recently the dismantling of its Hall furnace at Sharon, Pa.

BETHLEHEM EARNINGS

President Grace Makes Preliminary Statement—Serious Labor Shortage

President Eugene G. Grace of the Bethlehem Steel Corporation at the regular quarterly meeting of the directors held last Thursday made a preliminary report showing net earnings for 1922 of $4,605,330, after all charges. This, when placed against the previous year's net income of $10,332,804, reflects the absorption of the Lackawanna interests and stock issues occasioned thereby.

After deducting $3,662,000 for preferred dividends, the 1922 net income left $1.14 per share on the $82,500,000 of common stock.

Comparative income accounts for 1922 and 1921 are as follows:

	1922	1921
Gross sales and earnings..	$131,866,111	$147,794,353
Less manufacturing cost, operating expenses and taxes	114,957,170	125,943,819
Net manufacturing profit.	$16,908,940	$21,850,535
Other income	2,884,771	3,876,300
Total net earnings.....	$19,793,712	$25,726,834
Less interest and discount	8,689,193	9,391,314
Balance	$11,104,519	$16,335,519
Depreciation and depletion	6,499,188	6,002,715
Net income.....	$4,605,330	$10,332,804

Approval was given to issue $25,000,000 consolidated mortgage 30-year sinking fund, 5½ per cent gold bonds, series B, to provide for payment of $10,862,000 first mortgage bonds of the Lackawanna Steel Co., maturing April 1, 1923 (assumed by Bethlehem in connection with the Lackawanna purchase) and any unconverted balance of $10,858,000 Bethlehem 7 per cent secured gold notes, maturing July 15, 1923.

Earnings for the last eight years after taxes, depreciation and depletion appear below:

Year	Gross Sales	Depreciation and Depletion	Available for Interest
1915	$146,513,795	$4,716,000	$20,105,109
1916	216,284,556	14,350,786	47,366,524
1917	298,929,531	17,911,641	36,067,719
1918	448,410,808	31,510,366	25,678,402
1919	281,641,908	12,566,152	24,875,066
1920	274,431,236	13,941,514	22,410,029
1921	147,794,353	6,002,715	19,751,362
1922	131,866,111	6,499,189	13,294,524

Combined figures show that during these eight years $65,564,274 has been paid in cash dividends in comparison with $115,287,589 (after all charges) put back into the business. In other words, for each $1 of dividends paid, $1.76 has been applied to increasing the capacity and earning power of the system.

Of conditions within the industry Mr. Grace said these have "shown gradual improvement during the last nine months of the year both as to volume and prices. The advance in wages of approximately 20 per cent on Sept. 1 made a substantial increase in costs, and with the existing high cost of transportation, fuel and supplies generally, there seems no likelihood of reducing operating expenses."

In common with other steel interests the plague on progress is the limit of labor. A recent survey shows a shortage of 5000 men in the Bethlehem plants.

IRON ORE MINED

Increase in Output and Value in 1922 as Compared with Preceding Year

The iron ore mined in the United States in 1922, exclusive of ore that contained more than 5.5 per cent of manganese, is estimated at 46,963,000 gross tons, an increase of 60 per cent as compared with that mined in 1921. The ore shipped from the mines in 1922 is estimated at 50,046,000 gross tons, valued at $158,222,000, an increase of 88 per cent in quantity and of 76 per cent in value as compared with the figures for 1921. The average value of the ore per gross ton at the mines in 1922 is estimated at $3.16; in 1921 it was $3.37. The stocks of iron ore at the mines, mainly in Michigan and Minnesota, apparently decreased from 13,836,267 gross tons in 1921 to 10,699,000 tons in 1922, or 23 per cent.

These estimates, which are based on preliminary figures furnished by producers of 98 per cent of the normal output of iron ore, were made by Hubert W. Davis of the United States Geological Survey, Department of the Interior. They show the totals for the principal iron-ore producing States, and, by grouping together certain States, the totals for the Lake Superior district and for groups of Southeastern and Northeastern States.

Lake Superior District

About 86 per cent of the iron ore shipped in 1922 came from the Lake Superior district, in which 39,602,000 gross tons was mined and 43,095,000 tons was shipped, increases of about 58 and 89 per cent, respectively, as compared with the quantities mined and shipped in 1921. The ore shipped in 1922 was valued at $145,150,000, an increase of about 78 per cent.

The mines in Minnesota furnished 70 per cent of the total iron ore shipped from the Lake Superior district in 1922 and 60 per cent of the total of the United States. The mines in Michigan furnished 29 per cent of the Lake shipments and 25 per cent of the grand total.

Other States

The Southeastern States, which constitute the second largest iron-ore producing area, including the Birmingham and Chattanooga districts, mined 5,384,000 gross tons of iron ore in 1922, an increase of 80 per cent as compared with 1921. The shipments of ore from these States to blast furnaces in 1922 amounted to 5,372,000 gross tons, valued at $9,901,000, an increase in quantity of 84 per cent and in value of 85 per cent as compared with the quantity and value of shipments in the previous year. The ore contains about 78 per cent of hematite, 21 per cent of brown ore, and 1 per cent of magnetite. The average value of the ore in these States in 1922 per gross ton was $1.84; in 1921 it was $1.83.

The Northeastern States, which include New Jersey, New York and Pennsylvania, in 1922 mined 1,413,000 gross tons of iron ore and shipped 1,015,000 gross tons, an increase of 109 per cent in the quantity mined and of 113 per cent in the quantity shipped in 1921. The average value of the ore in these States in 1922 per gross ton was $2.03; in 1921 it was $3.75. Most of this ore is magnetite.

Imports and Exports

The imports of iron ore from Jan. 1 to Sept. 21, 1922, amounted to 684,387 gross tons, valued at $2,894,496, or $4.23 a ton. The imports for the year 1921 were 315,768 gross tons, valued at $1,075,909, or $3.41 a ton. The exports of iron ore for the 11 months ending Nov. 30, 1922, amounted to 602,095 tons, valued at $2,770,160, or $4.60 a ton, as compared with exports for the entire year 1921 of 440,106 tons, valued at $2,077,620, or $4.72 a ton. The statistics of imports and exports were compiled from the records of the Bureau of Foreign and Domestic Commerce of the Department of Commerce.

Erection of three large buildings to house a plant for the Bernard Gloeckner Co. of Pittsburgh in Erie, Pa., will be started soon. Joseph D. Fuhr of Pittsburgh has been awarded the contract. The site is on East Twelfth Street, near the works of the General Electric Co. The company manufactures restaurant and store fixtures and refrigerating machines.

Progress of organized industrial research in America and plans for expansion during 1923 will be discussed at the annual meeting of the Engineering Foundation Board, a department of the United Engineering Society, in New York, Feb. 8. Chairman Charles F. Rand will preside.

TO PERMIT DRAWBACKS

Regulations Relate to Use of Ferroalloys Made from Imported Ore

WASHINGTON, Jan. 30.—Covering the first ruling of the kind since the Fordney-McCumber tariff, Treasury regulations have just been issued permitting drawbacks in steel products made by the use of imported ferromanganese and spiegeleisen produced from imported manganese ore. The customary drawback of 99 per cent of the duties paid is allowed and is to apply from Dec. 27, 1922, on steel products exported when made from imported material. The duty on 80 per cent ferromanganese is $33.60 per ton; on spiegeleisen it is 75c. per ton, and on 50 per cent manganese ore it is $11.20 per ton, and 99 per cent of these respective duties would be $33.264, 74.25c. and $11.088. Because the prevailing duties on ferromanganese and manganese ore are much higher than they have been in previous tariffs the regulations are of unusual importance. Under the Underwood-Simmons tariff act these products, as well as spiegeleisen, were free of duty. The Payne-Aldrich act carried a duty of $2.50 on ferromanganese and spiegeleisen, while it made manganese ore duty free.

At the end of each period of manufacture, which shall not exceed six months, the regulations provide that there shall be filed a certificate of manufacture showing the identity and quantities of duty paid manganese during the period. In view of the blanket identification and minimum rate of allowance authorized, none other than manganese paying the same specific duty shall be used during any period of manufacture as the subject of drawback claims unless the products of material containing manganese are kept separate from other steel products. Where a drawback is claimed on this class of products, a separate certificate of manufacture is to be filed specifically identifying the duty paid material and establishing the quantity used. No drawback is to be allowed on products of any melt in which any domestic or free manganese is used. The drawback is to apply on the minimum quantity of duty paid material required to produce the quantity and kind of finished product exported as shown by sworn statements of manufacture, except where separate certificates of manufacture are filed, in which case the quantity of imported material on which drawback may be allowed may equal the quantity used.

Applying from Oct. 5 it is also provided that supplemental sworn statements may be filed covering additional plants making steel products for exportation with the benefit of drawbacks and upon verification of such statements and approval by the Department, drawbacks may be allowed on steel products manufactured at such plants. Provision is also made for supplemental sworn statements covering new kinds of steel products or changes in quantities of duty-paid material used when drawbacks will be allowed upon verification of the statements.

DELIVERIES URGED

Mahoning Valley Mills Extremely Busy—Price Trend Upward

YOUNGSTOWN, Jan. 30.—Mahoning Valley independents are participating in the active business which is featuring the iron and steel industry, and pressure for deliveries is increasing. Consumers are already beginning to inquire about second quarter requirements. One of the large automobile builders is seeking to contract for certain steel supplies for the rest of the year.

Sheet bars are difficult to obtain under $40, owing to the sold-up condition of makers, and some non-integrated rolling interests are disinclined to pay this price in view of the current levels in black and galvanized sheets. Producers of sheet bars and other forms of semi-finished steel are well obligated.

An advance in several lines of products, notably sheets, is expected at an early date. Most of the Valley sheet interests are sold through February, while some of their March tonnage is also contracted for. One interest which marked up its prices to 3.50c. for black and 4.50c. for galvanized grades, claims that it is not accepting business under these figures. Other sheet makers are asking higher prices for less attractive specifications.

With sheet bars firm at $38.50 and prospects of an advance to $40 appearing, a general upward movement in the price of sheets to the levels named above is indicated by several important interests. Rollers compelled to buy their raw steel contend that present quotations of 3.35c. on black and 4.35c. on galvanized grades are inadequate, in view of the mounting price of sheet bars. Such prices, they point out, were predicated on a $36.50 quotation for sheet bars, which generally applied at the beginning of the quarter.

Steel makers are keeping down their obligations, and in some cases are limiting them to 60 and 90 days. Pressure for full finished sheets, strips, tin plate and pipe is such that order books could be considerably strengthened, and could be filled for much longer periods, if makers desired to take the tonnage on the basis of current quotations.

Labor shortage is still retarding production to some extent, though labor conditions are now much more stable than shortly after the new year opened. Manufacturers look for a shortage of larger proportions in the spring, when outside construction draws its usual quota of workers.

PLANT ACTIVITIES

Large Production in Southern Ohio and Northern Kentucky Districts

IRONTON, Jan. 30.—Much activity in iron and steel production is now being witnessed in the southern Ohio and northern Kentucky districts. Twelve blast furnaces out of 17 are now active, and present indications point to a continuation of this activity for some months Furnaces in blast include Portsmouth furnace of the Whitaker-Glessner Co.; Star, Jisco and Globe silvery furnaces at Jackson; Milton furnace at Wellston; Etna furnace of the Marting Iron & Steel Co.; Sarah furnace of the Kelly Nail & Iron Co., and Belfont furnace of the Belfont Iron Works at Ironton; Hamilton furnace at Hanging Rock; Norton furnace of the Norton Iron Works, and the two Ashland furnaces of the American Rolling Mill Co. In addition to the above, the two Columbus furnaces of the American Rolling Mill Co. are in blast.

Of the steel plants in the district, the Whitaker-Glessner Co. is operating practically at full capacity, and its new rod and wire mills are scheduled to commence operations about the middle of February. The nail and wire mills of the Belfont Iron Works and the Kelly Nail & Iron Co. are operating to capacity. The nail plant of the Norton Iron Works at Ashland commenced full operations last week. The Ashland Steel Co. is operating its rod mill one turn, and when the fuel situation improves sufficiently will operate its open-hearth furnaces and billet mill on full schedule. All departments of the American Rolling Mill Co. are in full operation.

The plants of the Portsmouth By-Product Coke Co., the Ironton By-Product Coke Co. and the Ashland By-Product Coke Co. are running full, this being one of the few times since their completion where full operation has been secured simultaneously.

Ground has been broken for the addition to the American Rolling Mill Co.'s Ashland works. The addition is designed to double the finishing capacity of the plant, six sheet mills and a galvanizing plant being contemplated. The company is reported to have completed plans for the manufacture of specialties, such as are produced at its Middletown and Zanesville plants, as well as to take care of the regular trade in blue annealed, black and galvanized sheets. An unloading plant on the river front for the receipt of raw materials also is contemplated.

EXPORT TRADE INCREASES

European Situation Producing Inquiries—Japan, China and South America Active—Iron Importing No Factor

NEW YORK, Jan. 30.—Occupation of the Ruhr district of Germany has already stirred the countries of the world to a realization that orders for steel placed with Germany are uncertain of delivery, and a flood of inquiries has come to the United States, principally from Japan and the countries of South America. Japan is seeking principally structural shapes, plates, tin plate and sheets, while South America's chief demand is for galvanized wire and barbed wire. Inquiries from Europe have also been conspicuous; one, for instance, covers 3000 tons of wire rods from Denmark. Generally speaking, exporting steel companies find themselves unable to entertain business from new sources, having about all they can do, with labor shortage limits to increased output, to care for the demands of their regular avenues of exporting.

Merchant inquiry throughout the Far East is rapidly increasing from China as well as Japan. The Chinese market, which has shown practically no activity for months, is beginning to inquire of American exporters prices on wire, wire nails, galvanized and black sheets and tin plate. Although the number of inquiries is large, few orders are as yet reported from this source. Japanese merchant buying also shows considerable improvement, and most of the export houses, both Japanese and American, are handling numbers of small inquiries for light gage black sheets, usually either 13 or 27 sheets to the bundle, plain and galvanized wire, bars, tin plate, wire rods and at times a few kegs of wire nails. The greatest activity at present seems to be in black sheets and wire. From South American markets there is an increasing demand for galvanized and barbed wire.

Judging by reported orders of several of the large Japanese export houses in New York, in the past few weeks purchases of sheets have probably totaled several thousand tons, in contrast to practically no business of this kind for several months. Whether higher prices of black sheets now current will affect this buying is a difficult question, for under present conditions the price of American sheets c.i.f. Japanese port, is stated to be about $100 per ton, while the British sellers are still about $10 to $15 per ton lower. While the Japanese market looked forward to several months of low prices, following the announcement in December of the Imperial Steel Works of prices on plates, shapes and bars of $40 to $45 per ton and less, the possible relaxation of German competition, which is believed to have been one cause of the Government works' price decision, is thought may cause prices to rise.

Heavy buying of sulphate of ammonia is reported, a large number of exporters dealing with Japan now having inquiries and orders which are reported generally as being for about 500 tons or more. The leading interest is reported to be practically out of the market on sulphate of ammonia and another large source is well booked with orders. Among the current inquiries from Japan is the tender of the Imperial Government Railways, bids on which opened Jan. 30, for 123 tons of I-beams. There are several inquiries for rails still current, one of these being for 16 miles of 18-lb. rails and another for 15 miles of 60-lb. rails. In addition there is the inquiry calling for 20 miles of 100-lb. rails for Nanki, which is not yet closed. The Imperial Government Railways, although not yet inquiring for rails, recently closed with the Mitsubishi Shoji Kaisha, 120 Broadway, New York, for 525 tons of No. 8 gage galvanized wire and 225 tons of No. 8 gage plain wire for use in telegraph lines. Bids are now being submitted to a private purchaser on bout 200 tons of reinforcing bars. Although the Imperial Government Railways have not recently inquired for rails, it is noteworthy that some months ago more than 5000 tons were placed in Germany with the Thyssen interests, and these may be further delayed in deliveries.

Should the French place a tariff wall around Germany's principal coal and steel producing district, as latest cable reports suggest, it will obviously be difficult to get the German steel sold at prices as low as $40 per ton, delivered. The delivered price of American plates, shapes and bars in Japan, at $60 per ton, which works back to about 2c. per lb., Pittsburgh, may not hold long, it is believed, if the present demand from abroad increases.

According to a recent report received by the Bureau of Foreign and Domestic Commerce, the construction of a railroad in Mexico is practically assured, as funds for this purpose are now available. In addition to the work begun Nov. 11, on a line between Bukama and Ilebo in the Belgian Congo, other railroad construction is said to be contemplated.

The Bureau of Foreign and Domestic Commerce, 734 Custom House, New York, states that it has on file specifications covering the installation of pumping plant equipment issued by a municipality in Australia. Copies may be obtained by those interested in submitting bids. All bids must be in by June 26, 1923.

Pig Iron Imports

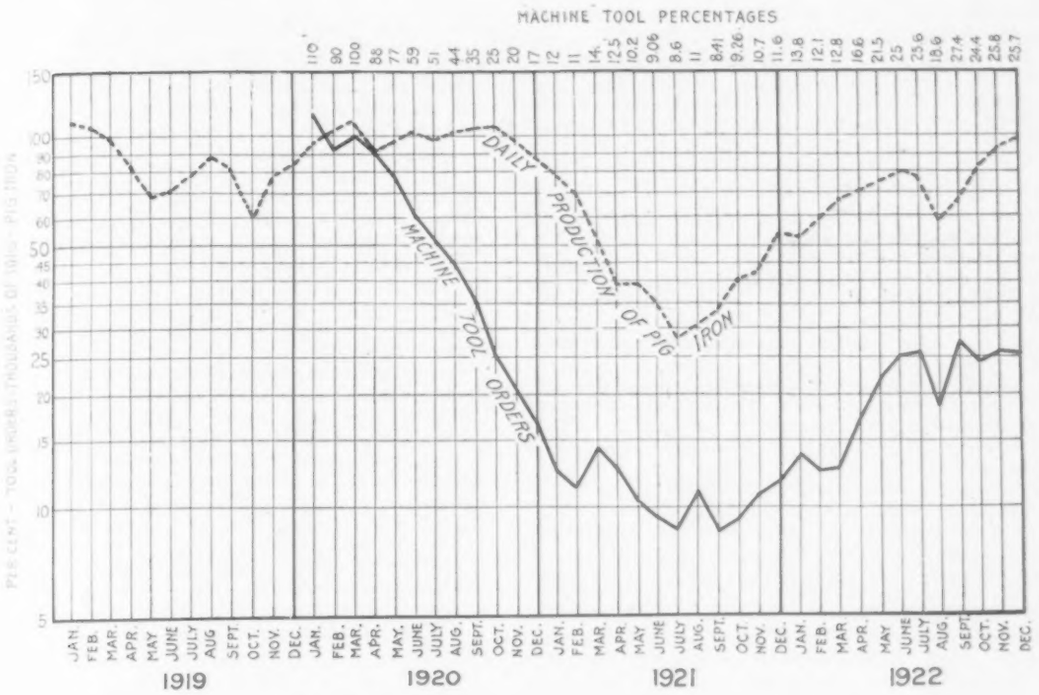
Importation of Scotch foundry iron is at a low ebb, with the price now being quoted on No. 3 Scotch foundry, according to one importer in New York, from $29.50 to $30.25 per ton, c.i.f. Atlantic port. Although foundries in the New England district still evince an interest in Scotch iron, the current price is considered prohibitive. An importer, who has until recently been handling a fairly large tonnage of pig iron from France, Germany and some from Belgium, states that shipments on contracts from Lorraine furnaces have ceased since recent political developments in Europe, the sellers claiming that they have no more pig iron available for export because of coke shortage. Shipments of small tonnages of surplus iron available at Hamburg, Germany, however, have been continued after a brief delay. Most of the large Belgian producers, this importer points out, are out of the market, namely, Ougrée-Marihaye and the Providence works.

Large Increase in Sales of Steel Castings in 1922

WASHINGTON, Jan. 30.—Sales of commercial steel castings in 1922 were almost three times as large as in 1921, and were at almost the same level as in the year 1920, according to an announcement by the Department of Commerce from data compiled by the Bureau of the Census in cooperation with the Steel Founders' Society from 65 companies comprising over two-thirds of the commercial castings capacity of the United States.

Commercial castings booked in 1922 by these companies, with a capacity devoted to commercial work of 1,162,800 tons per year, totaled 795,059 tons as against 287,674 tons in 1921, and 793,305 tons in 1920. The 1922 bookings were equivalent to 68.4 per cent of shop capacity, as against 24.7 per cent in 1921, and 68.2 per cent in 1920. Railroad specialties slightly exceeded miscellaneous castings in the 1922 sales, while in 1920 and 1921 the bookings of miscellaneous castings were about 50 per cent greater than railway specialties. Railway specialties were booked at 86.9 per cent of shop capacity in 1922 and miscellaneous sales at 56.3 per cent.

The largest monthly bookings of steel castings since the end of 1919 occurred in March, 1920, when 110,282 tons were booked, or 113.8 per cent of the shop capacity of the reporting firms. Thereafter an almost uninterrupted decline in bookings took place until the minimum of 15,785 tons was reached in July, 1921, at 16.3 per cent of shop capacity. Except for a slump in December, 1921, a gradual increase in bookings ensued until June, 1922, and, after two low months, reached in September the highest mark since March, 1920, with total bookings of 97,919 tons, or 101.1 per cent of shop capacity. Declines occurred in October and November, but December bookings were over 13 per cent larger than the November sales, with increases in both railway specialties and miscellaneous castings. December bookings equaled 71.1 per cent of shop capacity.


MACHINE TOOL PERCENTAGES
110 90 100 88 77 59 51 44 35 25 20 17 12 11 14 12.5 10.2 9.06 8.6 11 8.41 9.26 10.7 11.6 13.8 12.1 12.8 16.6 21.5 25 23.6 18.9 27.4 24.4 25.8 25.7
DAILY PRODUCTION OF PIG IRON
MACHINE TOOL ORDERS
PER CENT — TOTAL GROSS TONNAGE OF 1920 PIG IRON
JAN. FEB. MAR. APR. MAY JUNE JULY AUG SEPT OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1919 1920 1921 1922

Machine Tool Barometer Chart

HOW the machine tool business follows closely the fluctuations in pig iron production is shown in the accompanying so-called barometer chart drawn up by E. F. DuBrul, general manager of the National Machine Tool Builders' Association. The parallelism is noticeable for the years 1921 and 1922. The chart would indicate that the machine tool builder may use as one of his important checks on the way his business is going the reports on the current output of pig iron. The value in dollars of one months' orders of machine tools is expressed as a percentage of the average monthly total in dollars of machine tool orders taken in the first quarter of 1920; in other words, the total value of machine tool orders in the first months of 1920 is taken as 100, and any other month's business is expressed as a percentage of that total, when business was booming. In July, 1921, the value of orders amounted to only 8.6 per cent of the monthly average of the first quarter of 1920, and in September only 8.41 per cent. The average for all of 1921 was only 10.7 per cent, or a total for the year equal to a little more than January, 1920. In 1922 the volume was low at 12.1 per cent in February and high at 27.4 per cent in September, and was 20.8 per cent for the year, or only twice as good as 1921. The pig iron curve gives the average daily output for each month.

BRIER HILL ABSORBED

Chairman Kennedy Explains Reasons for Union with Youngstown Sheet & Tube Co.

YOUNGSTOWN, Jan. 30.—Properties of the Brier Hill Steel Co., one of the largest independent sheet makers in the country, operating 27 mills, are now under the control of the Youngstown Sheet & Tube Co., following formal ratification Jan. 26 of the sale of the company's assets. Holders of 92½ per cent of the common stock and 82½ per cent of the preferred stock had previously given their assent in writing to the sale. The Brier Hill company will ultimately be dissolved. Stockholders who exchange their holdings, under terms of the contract with the Sheet & Tube company, will participate in dividends payable April 1.

In commenting on the sale, J. B. Kennedy, chairman of the board of directors of the Brier Hill company, told stockholders that the company's properties were not properly balanced and it was compelled to sell each year about one-third of its output in the form of semi-finished steel, because of insufficient finishing capacity. "To provide the finishing mills would have cost a great deal of money," he stated. "We sold $10,000,000 of bonds to start this work, but after months of consideration came to the conclusion that instead of building we should avail ourselves of the opportunity to sell to the Sheet & Tube company. Common stockholders could not have expected dividends for from three to five years."

The annual meeting of shareholders of the Sheet & Tube company will be held Feb. 28, instead of Feb. 13, as originally scheduled. At that time details of financing necessary for acquisition of the Steel & Tube Co. of America, which the company has also purchased, will be explained.

Merger of Steel Wheel Makers

Completion of a merger of steel wheel manufacturers involving invested capital of $10,000,000 and eight plants with an output of 16,000 wood wheels and 8000 steel wheels per day, was announced on Jan. 28. The Motor Wheel Corporation, Lansing, Mich., manufacturer of wood wheels for passenger cars and trucks, and also of Tuarc steel wheels, has purchased from the Detroit Pressed Steel Corporation, trade mark, physical assets and good-will of Disteel wheels. The purchaser announced that the manufacture and sale of Disteel wheels will be continued without interruption. The Motor Wheel Corporation has also absorbed Forsyth Brothers Co., Harvey, Ill., manufacturer of Forsyth steel wheels. The direction of the latter company will remain in the hands of the present executives, with H. F. Harper as president.

Robert H. Anderson, secretary and treasurer Michigan Tool Co., Detroit, was slain by three bandits on Thursday, Jan. 25, in a $10,000 payroll hold-up in the stairway of the plant at Joseph Campau Avenue and Atwater Street. Mr. Anderson was also secretary and treasurer of the Colonial Tool Co., 217 Woodward Avenue, Detroit.

FABRICATED STEEL BUSINESS

Fabricated steel work awarded in the past week includes the following:

Equitable Building, Thirty-second Street and Seventh Avenue, New York, 18,000 tons, to American Bridge Co.

Roosevelt Hotel (United Hotels Co.) at Madison Avenue and Forty-sixth Street, New York, 11,000 tons, to American Bridge Co.

Printing lofts at 226 West Fortieth Street, New York, 3000 tons, to Bethlehem Fabricators, Inc.

Apartment building on West Eighty-second Street, New York, 900 tons, to Paterson Bridge Co.

Factory building for W. W. Lindsay & Co. at Marcus Hook, Pa., 600 tons, to McClintic-Marshall Co.

School building at Trenton, N. J., 350 tons, to McClintic-Marshall Co.

Simmons Co., plant addition, Kenosha, Wis., 2000 tons, to Kenwood Bridge Co.

Puget Sound Navy Yard, Washington, extension to Pier No. 4, 1354 tons, reinforced concrete construction substituted for structural steel.

Addition to plant at Ottumwa, Ia., 720 tons, to Pittsburgh-Des Moines Steel Co.

Seneca Copper Corporation, Gratiot Shaft Rock House, Mohawk, Mich., 350 tons, to Wisconsin Bridge & Iron Co.

John Morrell Packing Co., plant addition, Sioux Falls, S. D., 327 tons, to St. Paul Foundry Co.

Jeffries Mfg. Co., coal tipple, Harrisburg, Ill., 130 tons, to Vincennes Bridge Co.

School building, Monticello, Ia., 105 tons, to Des Moines Structural Steel Co.

Santa Fe Lines, signal bridges for various locations, 100 tons, to Hansell-Elcock Co.

Kenosha County, Wis., courthouse and jail, 150 tons, to Vulcan Mfg. Co., Fond du Lac, Wis.

Owens Bottle Co., Fairmont, W. Va., plant addition, 300 tons, to American Bridge Co.

Gas holder at Salina, Kan., 250 tons, to Stacey Mfg. Co.

Gas holder at Argentine, Kan., 200 tons, to Stacey Mfg. Co.

Structural Projects Pending

Bids close this week on the George Washington High School, New York, which will require about 5000 tons of steel, instead of 3000 tons as at first reported.

Inspiration Copper Co., addition to plant at Miami, Ariz., 1800 tons.

Addition to shops of Interborough Rapid Transit Co., 148th Street, New York, again in market, bids being received by Transit Commission on 4400 tons of steel.

Hotel, Portland, Me., addition, 100 tons.

Trumbull Savings & Loan Co., Warren, Ohio, bank building, 500 tons.

Two schools, Massillon, Ohio, 200 tons.

Ithaca Savings Bank, Ithaca, N. Y., 200 tons.

Two schools, Jamestown, N. Y., 200 tons.

Chicago Union Station Co., Roosevelt Road Viaduct, 4000 tons, revised bids to be opened this week.

City of Chicago, Roosevelt Road Viaduct, 750 tons, bids to be taken this week.

Rock Island Lines, five 100-ft. girder spans, 665 tons.

Cincinnati Galvanizing Co., tonnage unstated, bids to be asked about Feb. 1.

War Memorial Bldg., Nashville, Tenn., all bids rejected, and will be refigured.

British Metallurgist to Lecture in Eastern States

During February and March Dr. Walter Rosenhain, head of the metallurgical department of the National Physical Laboratory at Teddington, England, will tour eastern States, lecturing before various universities and technical organizations on metallurgical subjects. Dr. Rosenhain comes to this country under the auspices of the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, and will deliver the second annual Institute of Metals lecture, on "Solid Solutions," before that body on Feb. 19. Subjects of other lectures will be "Hardness and Hardening," Structure and Constitution of Alloys—to be delivered before Franklin Institute on Feb. 15—Strain and Fracture in Metals, Aluminum Alloys, and Metallurgical Research at the National Physical Laboratory. His itinerary will include Lehigh, Columbia, and Yale Universities, Production Club (Waterbury, Conn.), Massachusetts Institute of Technology, Case School of Applied Science, American Society for Steel Treating (Detroit), University of Illinois, and Engineers' Club of Dayton.

RAILROAD EQUIPMENT BUYING

Orders for 4700 Cars and 43 Locomotives—Fresh Inquiries of Fair Size

The Illinois Central has placed 3500 composite gondola cars, divided as follows: 1750 to Pullman Co., 750 to General American Car Co., 500 to Bettendorf Co. and 500 to Keith Railway Equipment Co.

The Pacific Fruit Express has ordered 100 express refrigerator cars from the General American Car Co.

The Chicago & Alton is inquiring for 200 miscellaneous freight car repairs.

The Carbo Steel Products Co. is in the market for 50 flat cars.

The Central of Georgia has placed orders for 100 stock, 200 gondola, 300 hopper and 500 box cars with the Chickasaw Shipbuilding & Car Co.

The Kansas, Oklahoma & Gulf Railway is in the market for 400 wooden gondola cars.

The St. Louis Southwestern (Cotton Belt) bought 15 locomotives from the Baldwin Locomotive Works.

The Nickel Plate Railroad has placed 28 locomotives with the Lima Locomotive Co., and is inquiring for 500 gondola cars and 500 open side hopper cars. The Ohio Steel Foundry Co. will make castings for the locomotives.

The Great Northern Railway is in the market for 25 Pacific and 25 mountain type locomotives.

The Illinois Central has placed 125 caboose cars with the American Car & Foundry Co.

The St. Louis-San Francisco is inquiring for 500 gondola bodies.

DETROIT'S PROSPERITY

Demand for Cars Exceeds Supply—War-time Methods Adopted

DETROIT, Jan. 29.—Detroit is in the midst of a wave of prosperity that has necessitated war-time methods to untangle the unprecedented congestion in railroad yards and terminals. The Detroit operating committee, consisting of W. D. Trump, general manager of the Detroit Terminal Railroad; H. O. Halstead, superintendent of transportation of the Pere Marquette Railroad, and S. W. Brown, assistant to the general manager of the Michigan Central Railroad, has been placed in charge of the situation. The threatened general embargo has been averted although the freight congestion is only slightly improved. Approximately 15,000 freight cars, including 1000 cars of bituminous coal, are lying idle on the side-tracks and at terminals waiting to be unloaded. Industrial plants, some of which have as high as 50 cars in the Detroit district, have been advised that further shipments will be stopped until they clear up the consignments now on hand. With embargoes already placed on 15 commodities, Mr. Trump said today that the fuel situation would not be aggravated.

In many instances the railroads have cancelled demurrage charges as a special inducement to get cars unloaded. All factories are working over-time and many of them with night shifts, so that the railroads have been swamped with deliveries of raw materials. Estimates have been made showing that the railroads in the Detroit district have carried more freight in the last 30 days than ever before in their history.

A building no less than 200 ft. square for handling and storing steel has been completed for Egleston Brothers & Co., Borden Avenue and School Street, Long Island City, N. Y. It has 50 and 60-ft. aisles, served by overhead electric traveling cranes, and a railroad siding extends the full length of the building across one end and material is thus taken directly from the cars to the storage places. Cranes have been installed for loading trucks. The building was erected by the Austin Co. from the New York office of that company.

Steel Corporation Basing Point Defense

Invoices Compared with Quotations Published by The Iron Age—Disclosures Made as to Costs—Commission Closes Its Case

CHICAGO, Jan. 30.—The United States Steel Corporation opened its defense Monday in the Pittsburgh basing point case at hearings started before the Federal Trade Commission in the latter's offices at 14 West Washington Street, Chicago. Judge C. A. Severance and W. W. Corlett were present as counsel for the Steel Corporation, while K. E. Steinhauer and E. W. Burr represented the commission. Examiner J. W. Bennett presided. The first witness called to the stand by the corporation was A. V. Winter, chief clerk invoice and pricing department, Illinois Steel Co., who introduced as evidence an analysis of all the invoices which had been entered in the record of the case by witnesses for the commission. According to a summary of this analysis 748 invoices were examined and on the dates they were entered as orders 64 per cent showed prices below the Pittsburgh base quotations published in THE IRON AGE, 31 per cent showed the prices, while 5 per cent of the invoice prices were above THE IRON AGE figures. The period covered by these invoices extended from 1900 to 1921, inclusive. On cross examination by Mr. Steinhauer, Mr. Winter explained that the invoices covered both specifications against contracts and miscellaneous orders and the records did not distinguish between the two. In the case of miscellaneous orders, the date of purchase practically coincides with the date of entering the order, but there is often a considerable interval between specification and the date on which the contract for the material has been closed.

Today Mr. Winter, again on the stand, offered as evidence all contracts of the Illinois Steel Co. covering plates, shapes and bars, except those with car builders, for the years 1908, 1910, 1911, 1912, 1914 and 1915. These contracts were separated into groups as to whether the terms when reduced to Pittsburgh base prices were under, over or the same as the Pittsburgh base as published in THE IRON AGE.

The Commission Closes

Prior to the opening of the corporation's defense, the commission called Mr. White to the stand to introduce a number of exhibits. Among these was a tabulation of mill costs in 1920 on plates, shapes, bars, and sheets, Chicago, Pittsburgh, and Birmingham, compared with Pittsburgh base prices, compiled from information supplied to the commission under date of Sept. 15, 1921, by the Carnegie Steel Co. and the American Sheet & Tin Plate Co. In the case of each commodity, the Chicago mill cost was lower than that of Pittsburgh. The Birmingham mill cost was higher than that of Pittsburgh on plates, but lower on bars. The Duluth mill cost on bars, which was also shown, was the highest of any producing point. For Pittsburgh the tabulation derives the gross profit by subtracting the mill cost from the Pittsburgh base price. In the case of Chicago and Duluth, the gross profit is obtained by adding to the margin between the mill cost and the Pittsburgh price the freight from Pittsburgh. For Birmingham, $5 a ton is added arbitrarily to the difference between the mill cost and the Pittsburgh base price. To illustrate, the Pittsburgh mill cost on soft steel bars was 2.25c. and the selling price 2.35c., leaving a margin of $2 a ton. The Chicago mill cost on bars was 2.04c., which left a margin of 31c. under the Pittsburgh selling price. Adding the freight of 38c. per 100 lb. from Pittsburgh, which was in force after Aug. 26, 1920, the Chicago delivered price was 2.73c., leaving a margin of 69c. per lb., or $13.80 a ton between the mill cost and the Chicago selling price.

Among other exhibits offered by Mr. White was a compilation to illustrate the disadvantage of the Chicago manufacturer of steel forgings in competing with the Pittsburgh manufacturer at a number of points in Michigan, Indiana, and other States in the Middle West. In this comparison, allowance is made not only for the freight from Pittsburgh to Chicago added to the mill price of the steel, but also for a waste of 30 per cent involved in the manufacture of forgings. In other words, the Chicago manufacturer pays the freight from Pittsburgh on the steel which is wasted as well as on that which goes into the finished forgings, while the Pittsburgh competitor pays freight on the shipment of his finished product only. On this basis, the disadvantage of the Chicago manufacturer in terms of finished products prior to June 30, 1922, was 54c. per 100 lb. at his own factory doors. At points outside of Chicago, the disadvantage was greater. Thus at Muskegon, Mich., the disadvantage is shown as 83.5c. per 100 lb., or 149 per cent of the freight rate from Chicago to Muskegon.

The filing of these exhibits completed the commission's case, and from now on the hearings will be devoted entirely to the presentation of the Steel Corporation's defense. The sessions at Chicago are expected to last five or six weeks, following which testimony will be taken at Pittsburgh, and finally at New York.

The Iron Age's Quotations

In the above telegram from Chicago, it does not appear in just what light the variation between invoice prices and IRON AGE quotations on steel products is to be presented in the development of the Pittsburgh plus case. That there may be no misunderstanding, it should be stated that the quotations of THE IRON AGE are on steel for early delivery. They may or may not be identical with prices at which steel products are being invoiced by the producers in the week in which the quotations appear, or with the forward delivery prices at which large contracts are closed.

As is well known to buyers and sellers of finished steel, contract prices—that is, contracts for the delivery of a certain tonnage of steel over, say, three months or six months—are often lower than the prices a consumer would pay who came into the market at some point in the contract period. They may be lower also than the price paid by a consumer who comes into the market at the same time and buys for early delivery. In a rising market the buyer on contract would be constantly receiving shipments for which the invoices would be in many cases several dollars a ton less than the ruling market at the time of shipment. The fact is well known also that plates, shapes and bars entering into steel cars are bought by the car companies at a concession from the price paid by the average buyer. It has also been true for years that agricultural implement manufacturers, when making their contracts for a six-months supply, have secured concessions from the prices paid by the average buyer.

EDITOR THE IRON AGE.

Iron and Steel Markets

LITTLE STEEL FOR EXPORT

Mills Decline Foreign Business; Product Needed Here

Sales of 20,000 Tons of Nova Scotia Pig Iron —Rolled Steel Prices Firmer

January ends with steel prices gaining in strength, though with a smaller volume of business in heavier products coming up than was the case in the first three weeks of the new year. At the same time open mill capacity has shown even a greater diminution.

In the Pittsburgh and adjacent districts the steel industry as a whole is still averaging an 80 to 85 per cent operation, while the average for the plants of the Steel Corporation in all districts exceeds the latter figure.

With works under such strain to meet the domestic demand, steel producers can make little response to the flood of offers of export business that have come in upon them in the past week. Germany has long been in default on deliveries of steel to various countries, and the further shortages that will result from the siege in the Ruhr have caused many buyers to turn to this country and to England.

Under present conditions the leading steel export companies are having difficulty in taking care of their regular foreign customers, even at the low rate of shipments in recent months. Japan and South American countries have been most active in seeking steel in this market, and Chinese inquiry has been larger than in many months. There have been European inquiries also, one from Denmark being for 3000 tons of wire rods.

With the shutdown of Lorraine and Luxemburg iron and steel works, added to the throttling of German production, British steel has been in great demand. Holland wants 10,000 tons of ship plates, but British plate and sheet mills are filled up for three months.

Increased fuel costs in Great Britain have put up pig iron and steel prices. At the same time owners of idle plants are chary of starting up under present chaotic conditions.

The feature of the domestic pig iron market this week is the sale of 20,000 tons of Nova Scotia basic pig iron in Philadelphia territory at several dollars a ton below the price of Pennsylvania iron. This competition comes just as the invasion of British and Continental irons, which was so marked last year, was considered to be over.

A northern Ohio steel company has bought a round tonnage of basic. In foundry iron, sales have been of only moderate size. Chicago prices on foundry and basic irons have advanced 50c. and in the South an advance of $1 is being asked for delivery after the first quarter. Accumulations of foreign pig iron, estimated at from 20,000 to 30,000 tons, have not yet been moved from Boston on account of the crippled condition of the railroads.

Contrary to the popular expectation of considerable increase, the Steel Corporation showed fourth quarter earnings almost identical with those of the third quarter. The statement emphasizes the persistence of high costs and the scant profit possible even on large scale operations. On the entire year the Corporation fell $11,000,000 short of earning its dividends. Railroad delays and congestion are still very costly.

Following purchases of 60 locomotives and 500 cars a week ago, the Illinois Central has bought 3625 more cars. Other car orders total 1200, and fresh car inquiries call for 1950. In locomotives 43 were ordered and the Great Northern has entered the market for 50.

A new Equitable building, 18,000 tons, and the Roosevelt Hotel, 11,000 tons, in New York account for three-fourths of the fabricated steel work closed in the week, the other jobs coming to light averaging 640 tons apiece.

Firmness is more marked in sheets and prices tend upward. Some advances have been made in blue annealed sheets. A shortage in automobile body sheets has led the leading builder to seek second quarter reservations subject to the prices that are established. January specifications for sheets and tin plates were much in excess of shipments.

The week has brought a considerable tightening in the supply of semi-finished steel and a number of producers are holding for higher prices.

Owing to their inability to buy steel from mills for prompt shipment, consumers are depending more on warehouse stocks and jobbers' sales in January show a large increase over the average for recent months.

THE IRON AGE composite pig iron price is now $26.88 per gross ton, advancing in the month from $25.79. The composite finished steel price remains at last week's level of 2.489c. per lb.; a month ago it was 2.439c.

Pittsburgh

Prices of Steel Products Very Strong — Pig Iron Market Quiet

PITTSBURGH, Jan. 30.—Steel prices continue to gain in strength because the sold-up condition of manufacturers prohibits their taking on much business for the present quarter, and they are disinclined to sell into the second quarter until there is some definite line on the conditions likely to prevail in that period as to costs and labor supplies. New demands coming before the market are not large in the ordinary sense of the word, but do appear large in relation to open capacity. Business prospects of important steel consuming industries are highly probable, and with the steel industry as a whole heavily obligated, any development that may interfere with production, and in turn deliveries, will, it is feared, be followed by too rapid advances in prices.

Generally the manufacturers by limiting the tonnage they take are endeavoring to prevent undesirable conditions.

The belief still is common that with the advent of

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Jan. 30, 1923	Jan. 23, 1923	Jan. 2, 1923	Jan. 31, 1922
No. 2X, Philadelphia‡	$29.76	$29.76	$29.76	$21.34
No. 2, Valley furnace†	27.00	27.00	27.00	19.00
No. 2, Southern, Cin'ti†	28.05	28.05	27.05	20.50
No. 2, Birmingham, Ala.†	24.00	24.00	23.00	16.00
No. 2 foundry, Chicago*	**29.50**	29.00	28.00	18.50
Basic del'd, eastern Pa.	*28.00*	28.50	26.75	19.84
Basic, Valley furnace	26.00	26.00	25.00	18.00
Bessemer Valley, del. Pitts.	29.27	29.27	29.27	21.46
Malleable, Chicago*	**29.50**	29.00	28.00	18.50
Malleable, Valley	27.00	27.00	27.00	19.50
Gray forge, Pittsburgh	28.27	28.27	28.27	20.96
L. S. charcoal, Chicago	33.15	33.15	33.15	30.50
Ferromanganese, furnace	107.50	107.50	100.00	58.35

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$40.00
Base billets, Pittsburgh	**38.50**	37.50	36.50	28.00
O.-h. billets, Pittsburgh	**38.50**	37.50	36.50	28.00
O.-h. sheet bars, P'gh	**39.50**	37.50	36.50	29.00
Forging billets, base, P'gh	**45.00**	43.00	43.00	32.00
O.-h. billets, Phila.	45.17	45.17	42.17	33.74
Wire rods, Pittsburgh	47.50	47.50	45.00	36.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	**2.10**	2.00	2.00	1.50
Light rails at mill	2.15	2.15	2.10	1.50

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.475	2.475	2.325	1.81
Iron bars, Chicago	2.35	2.35	2.35	1.60
Steel bars, Pittsburgh	2.10	2.10	2.00	1.50
Steel bars, Chicago	2.10	2.10	2.10	1.60
Steel bars, New York	2.34	2.34	2.34	1.83
Tank plates, Pittsburgh	2.10	2.10	2.00	1.40
Tank plates, Chicago	2.30	2.30	2.30	1.60
Tank plates, New York	2.44	2.44	2.34	1.78
Beams, Pittsburgh	2.10	2.10	2.00	1.50
Beams, Chicago	2.20	2.20	2.20	1.60
Beams, New York	2.44	2.44	2.34	1.83
Steel hoops, Pittsburgh	2.75	2.75	2.75	1.90

Sheets, Nails and Wire,	Jan. 30, 1923	Jan. 23, 1923	Jan. 2, 1923	Jan. 31, 1922
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.35	3.35	3.35	3.00
Sheets, galv., No. 28, P'gh.	4.35	4.35	4.35	4.00
Sheets, blue an'l'd, 9 & 10	**2.60**	2.50	2.50	2.25
Wire nails, Pittsburgh	2.70	2.70	2.70	2.50
Plain wire, Pittsburgh	2.45	2.45	2.45	2.26
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.15
Tin plate, 100-lb. box, P'gh.	$4.75	$4.75	$4.75	$4.75

Old Material, Per Gross Ton:				
Carwheels, Chicago	$27.00	$27.00	$25.50	$15.00
Carwheels, Philadelphia	**24.00**	23.50	20.00	16.50
Heavy steel scrap, P'gh	22.00	22.00	21.00	14.00
Heavy steel scrap, Phila.	*20.50*	21.00	18.00	12.00
Heavy steel scrap, Ch'go	**19.75**	19.25	18.50	11.25
No. 1 cast, Pittsburgh	24.00	24.00	22.50	16.00
No. 1 cast, Philadelphia	24.00	24.00	22.00	16.50
No. 1 cast, Ch'go (net ton)	**22.50**	21.50	21.00	13.00
No. 1 RR. wrot, Phila.	23.00	23.00	20.00	14.50
No. 1 RR. wrot, Ch'go. (net)	18.00	18.00	16.75	10.50

Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	**$9.00**	$8.00	$8.50	$2.75
Foundry coke, prompt	8.50	8.50	9.00	3.75

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**15.12½**	14.87½	14.75	13.62½
Electrolytic copper, refinery	**14.75**	14.50	14.50	13.37½
Zinc, St. Louis	**7.12½**	6.75	7.05	4.50
Zinc, New York	**7.47½**	7.10	7.40	4.85
Lead, St. Louis	**8.10**	8.00	7.10	4.40
Lead, New York	**8.20**	8.25	7.25	4.70
Tin (Straits), New York	**40.37½**	40.00	39.00	32.00
Antimony (Asiatic), N. Y.	**7.12½**	6.85	6.25	4.40

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.
The prices in the above table are for domestic delivery anddo not necessarily apply to export business.

Composite Price, Jan. 30, 1923, Finished Steel, 2.489c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Jan. 23, 1923,	2.489c.
Jan. 2, 1923,	2.446c.
Jan. 24, 1922,	2.062c.
10-year pre-war average,	1.689c.

Composite Price, Jan. 30, 1923, Pig Iron, $26.88 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Jan. 23, 1923,	$26.79
Jan. 2, 1923,	25.96
Jan. 24, 1922,	18.39
10-year pre-war average,	15.72

open weather there will be a considerable shortening in the supply of mill labor, and there seems to be some misgiving as to whether the wage increase of which there have been frequent intimations lately could be substantial enough to check the exodus of workers from the mills.

The most noteworthy development of the past week has been a decided tightening in the supply of semi-finished steel and a consequent stiffening in the price ideas of producers. Such business as has been done in the past week in this district in billets and sheet bars has been at $38.50, but it is extremely doubtful whether any sheet bars now could be placed at that figure and most makers now are uninterested in billets at that price.

The pig iron market here does not seem able to catch the stride of steel prices. In the face of great activity and advancing prices in scrap in all outside markets, it is impossible to record any sales here at any material change from the prices of the past two weeks.

The fuel situation is soft and it is a lack of sufficient supplies of cars, rather than the size of the demand, which is holding prices where they are. This is notably the case with coal.

There has been no material change in steel works and blast furnace operations in this and nearby districts in the past week. Shortage of steel has forced one Valley sheet maker to curtail operations, but this loss is pretty well offset by increased operation in the sheet making units of the American Sheet & Tin Plate Co. The Youngstown Sheet & Tube Co. has started its second Hubbard furnace and now has all six of its own stacks in blast. The Cambria Steel Co. will probably start its ninth furnace at Johnstown soon. The steel industry in this part of the country still is averaging 80 to 85 per cent and this rate probably represents a maximum until the labor situation becomes easier.

Pig Iron.—The market here is extremely quiet and there is no change in prices. It is reported that a Pittsburgh district sheet maker recently closed for 2000 tons of basic with a western Pennsylvania producer at $25.50, furnace, but outside of this transaction sales have been of very small lots and even these have not been so frequent as they were recently. Important consumers in this district are well covered by contract, and so far there has been no interruption to production or deliveries against these contracts. The demand comes entirely from the small consumers and evidently there is enough iron, since no advance in prices is obtainable. Some second quarter inquiries are noted in

foundry iron, but producers hesitate to name prices until the beginning of that period is closer at hand and they are more familiar with probable costs.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$26.00
Bessemer	27.50
Gray forge	$26.50 to 27.50
No. 2 foundry	27.00 to 28.00
No. 3 foundry	26.50 to 27.50
Malleable	27.00 to 28.00
Low phosphorus, copper free	35.00 to 36.00

Ferroalloys.—Users are well covered and current demands are few and small. The market is slightly firmer on spiegeleisen, which is up $1 per ton from the prices of a week ago, partly because of the sold up condition of commercial producers and partly in sympathy with ferromanganese. We note a few small sales of domestic 80 per cent ferromanganese at $107.50, f.o.b. Atlantic seaboard, or $112.29, delivered Pittsburgh. A sale of 100 tons of 10 to 11 per cent Bessemer ferrosilicon has been made to a Pittsburgh district user at $48.80, Jackson, Ohio.

We quote 80 per cent ferromanganese at $100 furnace, $107.50 seaboard, or $112.29 delivered Pittsburgh district for domestic or British, and 76 to 80 per cent German at $67 c.i.f. Atlantic seaboard. Average 20 per cent spiegeleisen, $34 to $37, furnace; 16 to 19 per cent, $33 to $36; 50 per cent ferrosilicon, domestic, $82.50 to $85, delivered. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10; 13 per cent, $56.10; 14 per cent, $61.10; silvery iron, 6 per cent, $34; 7 per cent, $35; 8 per cent, $36.50; 9 per cent, $38.50; 10 per cent, $40.50; 11 per cent, $43.80; 12 per cent, $47.10. The present freight rate from Jackson and New Straitsville into the Pittsburgh district is $3.66 per gross ton.

Semi-Finished Steel.—This market is moving upward in sympathy with finished products and also because so few makers have any tonnage for sale for delivery over the present quarter of the year. The shortage, however, appears to be more acute in other districts than it is here. It is the experience of one Pittsburgh interest having open-hearth billets for early and March delivery that buyers are not very anxious for supplies at $38.50, the price it is quoting on the base size, and that is as high as any business has been done recently. As high as $40, Pittsburgh, is being quoted by Eastern mills, and it is probable that mills in this and nearby districts, which are well committed, would not be interested in business at less, but no sales that high yet have been made here. It probably would be difficult for buyers to obtain small billets, sheet bars and slabs at less than $39.50, since the independent position of makers with regard to orders makes them unwilling to perform the extra labor without extra payment. Few lots of wire rods that are becoming available for market are readily disposed of at $47.50, base, and some makers are getting 50 from irregular buyers. Skelp prices are stronger now that plate capacity is so well engaged. The market no longer is quotable at less than 2.10c. for ordinary gages and widths of grooved and sheared material. We note sales of forging billets at $48.50, f.o.b. Portsmouth, Ohio, or $53, delivered Pittsburgh. The National Tube Co. recently took about 22,000 tons of Bessemer billets at a price believed to be slightly below the prevailing market, which now is not below $38.50 on either Bessemer or open-hearth steel. It is doubtful if forging billets now can be bought at less than $45, and on small tonnages some makers claim to be getting $47.50. Prices are given on page 379.

We quote 4 x 4-in. soft Bessemer and open-hearth billets, $37.50 to $38.50; 2 x 2-in. billets, $37.50 to $39.50; Bessemer sheet bars, $37.50 to $38.50; open-hearths, sheet bars, $37.50 to $38.50; slabs, $37.50 to $38.50; forging billets, ordinary carbons, $43 to $47.50, all f.o.b. Pittsburgh or Youngstown mills.

We quote No. 5 common basic or Bessemer rods, $47.50 to $50; chain rods, $47.50 to $50; rivet bolts and other rods of that character, $47.50 to $50; screw stock rods, $52.50 to $55 per gross ton f.o.b. Pittsburgh or Youngstown. Carbon rods command $3 per ton over base for 0.20 to 0.40 carbon; $5 over base for 0.41 to 0.55 carbon; $7.50 over base for 0.56 to 0.75 carbon, and $10 over base for over 0.75 carbon; acid rods, $15 over base.

Plates.—Prices on this product are extremely firm and while 2.10c. base, Pittsburgh, is possible on sizable tonnage for future delivery, some recent inquiries calling for early shipment failed to develop a lower price than 2.20c. Some mills which can take on a little early tonnage are seeking 2.25c. Prices are given on page 379.

Structural Material.—We now regard the market as firm at 2.10c., minimum. Buyers probably would have trouble in interesting any of the mills in a strictly new inquiry, especially if it called for early delivery, even at that price. Present bookings and protections are sufficient to keep the mills busy at the present rate of operations beyond April 1. Not much structural business is coming out in this territory, but the county commissioners have proposed a bond issue of $9,000,000 to cover the cost of three new bridges in Pittsburgh and the raising of others to conform to War Department regulations. Plain material prices are given on page 379.

Iron and Steel Bars.—Some mills now are asking as high as 2.25c. for merchant steel bars, but there are no sales of any consequence, even for small lots for immediate shipment at that price. The market here, however, is not below 2.10c., as all makers are well filled up and beyond the condition where inquiries of attractive character would influence higher prices. There has been no further change in iron bar prices.

We quote steel bars rolled from billets at 2.10c.; reinforcing bars, rolled from billets, 2.10c. base; rail steel reinforcing bars, 2c.; refined iron bars, 2.75c. in carloads, f.o.b. mill, Pittsburgh.

Wire Products.—Demand holds strong for all products and with at least two important producers in this district out of the market, strictly new business is placed only with considerable difficulty. All makers are heavily obligated and having no stocks worthy of note spring demands must be met almost completely from current production. Capacity in this district is well engaged, but production performance is not in keeping with that condition because of labor shortages in essential spots. The leading interest has made no change in prices. There is considerable comment, in view of its recent revision in plain and galvanized wire extras, that it has not yet changed prices of either galvanized barbed wire or woven fence. Prices are given on page 379.

Steel Rails.—Some makers of light rails, rolled from billets, now are asking 2.25c. base, but 2.15c. still must be regarded as the going market, since demand hardly is strong enough to sustain a higher figure.

We quote 25 to 45-lb. sections, rolled from new steel, 2.15c. base; rolled from old rails, 2c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

Rivets.—The market still is weak on small rivets, in which competition for orders still is sharp, but it is claimed that steep concessions to secure specifications on contracts for large rivets are disappearing and that quotations are more representative of sales than they were recently. Prices and discounts are given on page 379.

Hot-Rolled Flats.—On material of ordinary gages and widths, 2.75c., base, Pittsburgh, still is possible, but 2.90c. is more generally sought than was the case recently, when some business was placed as low as 2.50c. and a very considerable tonnage of hot-rolled strips was entered at 2.60c., base. Narrow, light gage material is commonly priced at 3.25c., base, but there is some question that all makers are insisting on that figure. Prices are given on page 379.

Bolts and Nuts.—Specifications against contracts are increasing again, but it is not claimed that this development is unaided by price concessions. Actually, quoted discounts still are realized only in a few cases and then on small orders. A return to quoted discounts is expected, however, because of the increased strength of steel. Quoted discounts are given on page 379.

Cold-Rolled Strips.—There is no change in the price, which holds at 4.50c., base, Pittsburgh, for both present and second quarter business. Makers are well committed, but evidently are keeping their customers

supplied, since there is a notable lack of spot demand and premium prices for early deliveries.

Sheets.—The market is growing stronger as the mills get filled up for the present quarter and withdraw from the market. Greatest strength is observed in blue annealed sheets on which 2.60c., base, has become the going minimum, while sales are being made up to 2.75c., base. Black sheets still are obtainable for this quarter's delivery at 3.35c., base, and galvanized at 4.35c., base, but as much as 3.45c., base, lately has been done on black and the number of mills willing to take galvanized at 4.35c., base, is fewer than a week ago. There is little question that second quarter prices of independents will be $3 to $5 a ton over the first quarter prices, it being claimed that such an advance is warranted by the increase in materials and labor costs. Mill operations are high, with the leading interest running 90 per cent of its mills, and the independents even higher. Industry as a whole is probably running around 93 per cent and shipments are close up, since except to embargoed points in northern New York and New England, there is no interference with deliveries. Prices are given on page 379.

Cold-Finished Steel Bars and Shafting.—Since a week ago, leading makers have gone to a base of 2.65c., Pittsburgh, for carloads, and 2.90c., for less carloads, an increase of $3 per ton. This price has been adopted by one interest here, which recently advanced to 2.75c.; the market, therefore, is quotable at a flat price of 2.65c. base, for carloads. A corresponding advance has been made in ground shafting to 3.05c., base, f.o.b. mill, for carloads. Demand is good, but the market derives its chief strength from the hot-rolled bar market.

Tin Plate.—This market is exceedingly strong as specifications are heavy and are absorbing production to such an extent that few mills are accumulating any stocks. Right now, stock items are not available at less than the price of production plate and premiums are expected for such material in the event there are any interruptions to production. We continue to quote standard cokes at $4.75 per base box, Pittsburgh, and except for the usual preferentials granted large consumers, there are no deviations from that basis. A fresh attempt by the Western railroads to win Pacific Coast tin plate business away from the inter-coastal steamship lines is seen in the announcement that, effective March 7, the rate from Chicago to the coast will be 75c. per 100 lb., against the present rate of $1.20 from either Pittsburgh or Chicago. A rate of 85c. from Pittsburgh has been proposed, but acceptance by Eastern lines is in doubt.

Tubular Goods.—There is no let up in the demand and makers are falling further and further behind their obligations. Makers of steel pipe are fully 90 days behind their standard pipe orders, with some sold ahead for four months, while on oil country goods and line pipe, 60 days is now the very best delivery that is promised by any of the mills, and 90 days is the quickest shipment promised by others. The Philadelphia Co. recently placed its spring requirements of oil well pipe, amounting to between 1500 and 2000 tons with a Western mill. The Sinclair Pipe Line Co. has put out an inquiry for between 700 and 900 miles of 8, 10 and 12-in. line pipe, well up toward 100,000 tons, for Wyoming. Expectations of higher steel pipe prices are strengthened by the action of the National Tube Co., under date of Jan. 23, in advancing prices of merchant boiler tubes, lap welded and seamless, 2 in. and larger, $6 per ton. This change was adopted by independent makers. There is no change in charcoal iron boiler tubes. Boiler tube makers generally are sold up for two to four months, the heaviest commitments being in lap welded steel tubes. The Wheeling Steel Products Co., effective Jan. 26, advanced prices of steel pipe another point, or $2 a ton. Its card discounts on base sizes of standard pipe are 63 per cent for black and 52½ per cent for galvanized. Discounts are given on page 379.

Track Fastenings.—Advance of $3 per ton in spikes made by Western makers last week has been adopted by makers here. There has been no change in small spikes or in boat and barge spikes, but track bolts now are quoted at $3.85 base per 100 lb. for carloads and $4.50 for less carloads, against $3.75 and $4.25, respectively a week ago. Independent makers of tie plates are quoting up to $52 per net ton. Prices are given on page 379.

Coke and Coal.—Coke prices do not grow much easier except on heating fuel, demand for which has become so limited that the price is now down around $7 per net ton at ovens, as against about $8 recently and sales as high as $9.50 during the height of the Eastern demand a few weeks ago. Strictly standard furnace coke is not available at less than $8 per net ton at oven, and some sales have been made in the past week of $8.25. Foundry coke is very firm, and on standard hand-drawn grade $9 per net ton, ovens, is minimum and up to $9.50 has been paid. Expectation of lower prices has led to the withdrawal from the coal market of the railroads and steam grade is down 25c. a ton to $3 to $3.25 for mine run as a result of that development. Gas and cooking coal is quotable at $3.50 to $3.75 per net ton at mines as against about $4 recently. The demand is light and would not sustain these prices if car supplies were sufficient to permit full production.

Old Material.—This market is slow to respond to the strength of outside markets, because melters here still are holding off. It is impossible to change prices materially, but local quotations are so far out of line with those elsewhere that they mean little and are likely to advance sharply on the appearance of any buying here. Dealers' stocks are low and other supplies cannot be had cheaply with other markets paying so much higher relative prices. The Baltimore & Ohio Railroad is offering 19 cars and 16,135 gross tons of scrap bids on which will be received until noon, Feb. 5.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel	$22.00 to	$22.50
No. 1 cast, cupola size	24.00 to	24.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; and Franklin, Pa.	22.00 to	22.50
Compressed sheet steel	20.50 to	21.00
Bundled sheet sides and ends	19.00 to	19.50
Railroad knuckles and couplers	24.00 to	24.50
Railroad coil and leaf springs	24.00 to	24.50
Low phosphorus standard bloom and billet ends	26.00 to	26.50
Low phosphorus, plates and other grades	25.00 to	25.50
Railroad malleable	22.00 to	22.50
Locomotive axles, steel	24.00 to	25.00
Steel car axles	23.00 to	23.50
Cast iron wheels	23.50 to	24.00
Rolled steel wheels	24.00 to	24.50
Machine shop turnings	17.50 to	18.00
Heavy steel axle turnings	19.00 to	19.50
Short shoveling turnings	18.50 to	19.00
Cast iron borings	19.00 to	19.50
Heavy breakable cast	20.00 to	20.50
Stove plate	17.00 to	17.50
Sheet bar crop ends	23.00 to	23.50
No. 1 railroad wrought	20.50 to	21.00

Proposed Reduction of Rates on Steel Products Not Justified

WASHINGTON, Jan. 30.—The Interstate Commerce Commission in a decision handed down last week held that the Union Pacific Railroad had not justified its proposal to reduce rates on structural steel, rails and rail fastenings, between Midvale, Utah, and Boise, Idaho, on the one hand, and North Pacific Coast points on the other, without making similar reductions at intermediate points. The tariffs were filed to become effective Sept. 22, 1922, and proposed a reduction in the rate on structural steel from 67.5 to 62.5c. per 100 lb.; on steel rails from $15.12 to $11.25 per ton, and on rail fastenings from 67.5 to 56.5c. per 100 lb.

Chicago

Delivery Problems Paramount — Pig Iron Prices Strong and Higher

CHICAGO, Jan. 30.—The delivery problem is consuming the attention of local steel mills. With further increases in production blocked by a shortage of fuel and a scarcity of common labor, every effort is being made to make an equitable allotment of current output. The situation is complicated by the fact that the railroads are pressing hard for deliveries against their rail contracts as they wish to take advantage of the universally mild weather to carry forward their track laying program. Local mills are no longer able to take new business for first quarter delivery and the Inland Steel Co., which is adhering to a policy of booking by quarters only, has withdrawn from the market on plates, shapes, bars and sheets, but expects to announce second quarter prices within a week or two.

Pig Iron.—While the market cannot be described as strikingly active, a steady flow of business is coming in, including some large individual tonnages. Prices continue strong and local furnaces have advanced their product to a minimum of $29.50 for forward business and 50c. higher for prompt material. A Wisconsin user has closed for 1000 tons each of malleable and foundry for second quarter shipment, and another melter in the same State has placed 1000 tons of foundry for delivery during the rest of first half. The Southern furnace shipping by water and rail has booked a total of 8000 tons for second quarter on the basis of $28, Chicago. Of this total, 5000 tons went to one Chicago buyer and 1000 tons to another local melter, while the remainder was made up of smaller amounts. Minimum going prices from other furnaces in the South appear to be $24 base for first quarter and $25 base, Birmingham, for second quarter. No recent sales of low phosphorus are reported, but the best price now quoted is $37 delivered, Chicago. An early advance in charcoal is expected.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$33.15
Northern coke, No. 1, sil. 2.25 to 2.75	$30.00 to $30.50
Northern coke, foundry No. 2, sil. 1.75 to 2.25	29.50 to 30.00
Malleable, not over 2.25 sil	29.50 to 30.00
Basic	29.50 to 30.00
High phosphorus	29.50 to 30.00
Southern No. 2, first quarter	30.01 to 31.01
Southern No. 2, second quarter	28.01 to 31.01
Low phos., sil. 1 to 2 per cent, copper free	37.00
Silvery, sil. 8 per cent	41.29

Plates.—The Illinois Central has placed orders for 3500 composite gondola cars in addition to the 500 ballast cars bought a week ago and the Central of Georgia has closed for 1100 cars. This rolling stock will involve over 50,000 tons of plates, shapes and bars. The Sinclair Crude Oil Purchasing Co., which placed 30 tanks for Wyoming last week, is still in the market for tanks for that field, involving 15,000 tons of plates. The Roxana Petroleum Co. is inquiring for 10 80,000-bbl. tanks for Oklahoma and five of the same size for Illinois, involving a total of 4500 tons of plates. Local mills are no longer seeking business; their present problem is to satisfy the needs of their customers. The leading interest is allotting its output to the end that each customer will receive as large a percentage of his requirements as current mill operations permit. The Inland Steel Co. has withdrawn from the market, but will announce second quarter prices in a week or two. It expects that output for that period, like that of the first quarter, will have to be allocated among customers. An increasing amount of business is going to mills east of here owing to the heavy commitments of local producers.

The mill quotation is 2.20c. to 2.30c., Chicago. Jobbers quote 3.05c. for plates out of stock.

Cast-Iron Pipe.—Buying is heavy and prices have advanced to a minimum of $45, base Birmingham, for 6-in. and larger. Both municipalities and gas companies have placed large tonnages. Buying by the latter has been unprecedented for this season. Sellers assert that the time is close at hand when there will be a pronounced scarcity of the smaller diameters for early delivery. The United States Cast Iron Pipe & Foundry Co. has booked 300 tons for Pleasant Ridge, Mich., 300 tons for Omaha and 1725 tons for the Milwaukee Sewerage Commission. Pending business includes: Milwaukee, 3000 tons of 6 to 16-in., bids to be in Feb. 12; Dubuque, Iowa, 1000 tons, Jan. 30; Fond du Lac, Wis., 300 tons, Jan. 30; Kenosha, Wis., 685 tons, Feb. 2; Mankato, Minn., 100 tons of 6-in., Feb. 13; Minneapolis, Minn., 40,000 ft. of 6-in., 16,000 ft. of 8-in., 10,000 ft. of 12-in. and 100 tons of specials, Feb. 7; Rockford, Ill., 350 tons of 6 and 8-in. and larger, and 50 tons of specials, Feb. 5.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $57.20; 6-in. and above, $53.20; class A and gas pipe, $3 extra.

Wire Products.—The American Steel & Wire Co. has advanced bright hard plain wire to $2.55, base Pittsburgh, per 100 lb., or $2 a ton above its previous price. Black annealed plain wire is no longer quoted at the same price as bright hard wire, but takes an extra 15c. per 100 lb. above the base price for the latter product. Annealing incurs an additional manufacturing cost and the extra has been established to cover it. The quotations on bright hard wire and black annealed wire are now the same as those of independent mills. The Steel Corporation subsidiary has not yet made any change in its nail quotations. For mill prices, see finished iron and steel, fo.b. Pittsburgh, page 379.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.45; No. 9 and heavier bright basic wire, $3.30 per 100 lb.; common wire nails, $3.45 per 100 lb.; cement coated nails, $2.90 per keg.

Rails and Track Supplies.—The Illinois Central has placed an additional order covering 18,000 tons of rails with the Gary mill. Adding this to the tonnage which is contracted for last fall, the road's rail contracts for this year exceed 100,000 tons and place it in a class with the Pennsylvania, the New York Central and other heavy buyers. Both local producers are heavily committed on both rails and track supplies, one of them being sold up tight for six months.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.15c., f.o.b. makers' mills.

Standard railroad spikes, 3c. mill; track bolts with square nuts, 3.85c. to 4c., mill;; iron tie plates, 2.50c.; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.65c. base and track bolts, 4.65c. base.

Bars.—Soft steel bars are no longer available from local sources for first quarter shipment. One mill has withdrawn from the market and will announce second quarter prices in a week or two, another is sold four months ahead, and a third with from five to six months' business on the books continues to accept business for indefinite delivery. Buyers desiring early delivery are placing an increasing number of orders with mills east of here. The growing scarcity of mild steel has been reflected in heavier buying of bar iron. Railroads and car builders have placed liberal orders for the latter commodity and mills are getting into a more comfortable position. One mill which is operating on a single turn basis has built up a two months' backlog. The quotation of 2.35c., f.o.b. works, is no longer regarded attractive in view of increasing scrap costs and one producer turned down an order for 1200 tons offered at that price. An increasing proportion of current business is moving at higher quotations and it is felt in some quarters that the market will soon move up to a minimum of 2.50c. Business in rail steel bars is also improving although not so rapidly. One mill which has a subsidiary making steel posts is committed for two-

thirds of this quarter, but other producers are not in so satisfactory a position.

Mill prices are: Mild steel bars, 2.10c., Chicago; common bar iron, 2.35c. to 2.50c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote, 2.95c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.65c. base; hoops, 4.30c.; bands, 3.75c.

Bolts and Nuts.—Specifications are liberal and new business is in good volume. Discounts are firm at the September level and bolt and nut shops are showing increasing concern about their raw material supplies as the forward commitments of the steel mills grow heavier. The Ford Motor Co. has placed additional orders for nuts and is in the market for 8,000,000 to 12,000,000 stove bolts. Specifications are heavy from automobile makers who placed contracts and those from the farm machinery manufacturers are also steadily increasing.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.85c.; machine bolts up to ⅞ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to ¾ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $2.75 off; blank nuts, $2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off.

Reinforcing Bars.—Lettings were heavy during the past week, and a large amount of new work has appeared. With local mills booked all the way from three to six months ahead, concrete bar dealers are increasingly cautious in quoting on new tonnages. It seems probable that sellers will have to draw upon Eastern mills for part of their supplies in the near future. January business in concrete bars has been unprecedented in terms of both shipments and sales. Up to Jan. 20 one large dealer shipped three times as much tonnage as during the same period in January last year. Warehouse prices will be 2.65c. base, effective Feb. 1, and if the mill situation becomes more tense, further advances may prove necessary.

Awards include:

Katzinger Building, 700 tons to Kalman Steel Co.
Hotel, Madison, Wis., 500 tons to Corrugated Bar Co.
Missouri road work, 500 tons to Corrugated Bar Co.
Hotel, Green Bay, Wis., 400 tons to Corrugated Bar Co.
Illinois road work, 300 tons to Kalman Steel Co.
Oklahoma road work, 300 tons to Corrugated Bar Co.

Pending work includes:

Studebaker Corporation, South Bend, Ind., plant addition, 1000 tons.
United States Veterans' Hospital, Camp Custer, Battle Creek, Mich., 500 tons.
Waldorf Boxboard Co. plant, St. Paul, Minn., 500 tons.
Northwestern Life Insurance Co. building, Minneapolis, Minn., 300 tons.
Courthouse and jail, Kenosha, Wis., 300 tons still to be let.
School buildings, Kenosha, Wis., 400 tons.
Pawling & Harnischfeger plant addition, Milwaukee, 500 tons.
Aluminum Goods Mfg. Co. plant addition, Manitowoc, Wis., 500 tons.
Palmolive Co. plant addition, Milwaukee, Wis., 500 tons.
State highway bridges, Lexington and Glasgow, Mo., 300 tons.

Sheets.—The local independent has withdrawn from the market but will soon announce second quarter prices. While there have been no indications as to what these quotations will be, independents generally are expected to advance prices on material for shipment during the next quarter. It is also intimated that there will be an increase in the spread between galvanized and other grades of sheets.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.75c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago, 4c. for blue annealed, 4.85c. for black and 5.85c. for galvanized.

Structural Material.—Fabricating awards involve considerable tonnage, although not including such large individual amounts as were reported a week ago.

The mill quotation on plain material is 2.20c., Chicago. Jobbers quote 3.05c. for plain material out of warehouse.

Rolled Steel Wheels.—The sales of the local producer last week were the heaviest in the history of the plant.

Warehouse Prices.—Local jobbers have advanced seamless and lapweld steel boiler tubes an average of ½c. per ft.

Steel Castings.—Notwithstanding recent weak spots in the market, the miscellaneous castings for 2500 cars have been placed at the full market. The castings for fully 25,000 cars are still pending involving a total of 10,000 tons.

Coke.—Owing to poor deliveries of coal, the local by-product producer is not operating its Chicago or Milwaukee ovens at above 60 per cent of capacity. At Chicago its foundry coke remains unchanged at $15, delivered, while at Milwaukee the price is $15.75. Considerable foundry coke is coming in from the South and the Connellsville and adjacent sections. Southern by-product foundry coke is selling at from $8.25 to $8.75, Birmingham, or $12.55 to $13.05 delivered.

Old Material.—Consumer buying, while still hesitant, is gradually expanding and the trend of prices continues in an upward direction. Recent purchases of heavy melting have been made at $19.75 and $20 a gross ton. Cast and malleable grades are being bought more freely and a fair tonnage of low phosphorus scrap has moved to steel foundries. Iron mills have also made moderate purchases. The shortage of scrap has been relieved somewhat by more liberal railroad offerings, three roads having disposed of a total of about 16,000 tons within the past week. The open winter has been favorable to the collection of country scrap and larger accumulations are expected to be placed on the market within a month or two. Consumers with stocks to fall back on are still waiting for the market to break. Current railroad offerings include a blind list advertised by the Big Four; the Pennsylvania Northwestern Region, 2500 tons, and the Pennsylvania Southwestern Region 4500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$23.50 to $24.00
Cast iron car wheels	27.00 to 27.50
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	25.50 to 26.00
Rails for rolling	21.00 to 21.50
Steel rails, less than 3 ft.	23.00 to 23.50
Heavy melting steel	19.75 to 20.00
Frogs, switches and guards cut apart	19.75 to 20.00
Shoveling steel	19.50 to 19.75
Drop forge flashings	15.50 to 16.00
Hydraulic compressed sheets	17.00 to 17.50
Axle turnings	17.50 to 18.00
Per Net Ton	
Iron angles and splice bars	23.50 to 24.00
Steel angle bars	19.50 to 20.00
Iron arch bars and transoms	23.00 to 23.50
Iron car axles	26.50 to 27.00
Steel car axles	20.50 to 21.00
No. 1 busheling	16.25 to 16.75
No. 2 busheling	11.00 to 11.50
Cut forge	17.50 to 18.00
Pipe and flues	13.50 to 14.00
No. 1 railroad wrought	18.00 to 18.50
No. 2 railroad wrought	17.50 to 18.00
Steel knuckles and couplers	22.50 to 23.00
Coil springs	24.00 to 24.50
No. 1 machinery cast	22.50 to 23.00
No. 1 railroad cast	21.00 to 21.50
No. 1 agricultural cast	21.00 to 21.50
Low phos. punchings	19.00 to 19.50
Locomotive tires, smooth	19.50 to 20.00
Machine shop turnings	12.50 to 13.00
Cast borings	14.00 to 14.50
Short shoveling turnings	14.00 to 14.50
Stove plate	19.00 to 19.50
Grate bars	19.00 to 19.50
Brake shoes	19.25 to 19.75
Railroad malleable	22.75 to 23.25
Agricultural malleable	22.75 to 23.25

Inland Steel Co. Negotiating with Jones & Laughlin Steel Corporation

CHICAGO, Jan. 30.—The Inland Steel Co., which has figured prominently in numerous proposed mergers, is now negotiating with the Jones & Laughlin Steel Corporation, with a view to consolidating the properties of the two companies.

New York

No Let Up in Structural Steel Demand—Coke Slightly Easier

NEW YORK, Jan. 30.—Embargoes continue on the New Haven and other lines, and deliveries of pig iron, especially into New England, are made with difficulty. Buying has been limited, and while one agency sold 4000 tons and another 3000 tons, demand was not active and most of the sales were for a few hundred tons. For immediate delivery, $28 is the prevailing price at Buffalo for first quarter, but $27 can be done for second quarter. In eastern Pennsylvania $28 for No. 2 plain for the first half is quoted and seems to be pretty well established. Few transactions in foreign iron are reported and the belief prevails that there will not be much more imported for a considerable time.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$32.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	31.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	30.27
Buffalo, sil. 1.75 to 2.25	31.91
No. 2X Virginia, sil. 2.25 to 2.75	33.44
No. 2 Virginia, sil. 1.75 to 2.25	32.44

Ferroalloys.—Demand for ferromanganese is confined to small lots which have sold at the new price of $107.50. There is, however, no large business before the market. The same condition exists in the spiegeleisen market, sales having been made of only carload and small lots at $37, furnace, for the higher grade alloy. Manganese ore from Brazil is reported to have sold recently at 33c. to 34c., c.i.f. Atlantic ports. It is stated that Indian ore cannot be bought at less than this, but that Caucasian ore is being sold at 29c. to 30c. The fact that the Electrometallurgical Co. has recently acquired control of the Electro Metals, Ltd., at Welland, Ont., has somewhat changed the complexion of the 50 per cent ferrosilicon market. Importations of the Canadian product are now being made, but to what extent these affect the price situation is not clear. Reports in the trade are that the alloy can be bought for first quarter delivery at a minimum of $82.50, delivered, and that one or two small domestic producers are now running at capacity on this alloy. Other statements are that early delivery alloy cannot be obtained at less than $85 to $90, delivered. One seller is offering the imported product at $87.50, delivered, and is also selling the 14 to 16 per cent alloy at $48, delivered. The ferrochromium market is quiet, quotations ranging from 12c. to 14c. per lb. contained chromium, delivered. Quotations are as follows:

Ferromanganese, domestic, furnace, per ton	$107.50
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port	$107.50
Spiegeleisen, 17 to 19 per cent, furnace	$35.00 to $37.00
Spiegeleisen, 20 per cent, furnace or duty paid	$34.00 to $36.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads	$82.50 to $87.50
Ferrotungsten, per lb. of contained metal	90c. to 95c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton	$200.00

Ores

Manganese ore, foreign, per unit, c.i.f.	29c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$7.50 to $8.50
Chrome ore, basic 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	$18.00 to $28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	60c. to 70c.

High Speed Steel.—Business continues good, although orders are generally small. Prices are reported firm by most producers, who are quoting 75c. to 80c. per lb. for 18 per cent tungsten high speed steel, with special brands of some companies ranging up to 90c. per lb.

Warehouse Business.—Prices are firm since the increase of last week and business is reported good. While there has been no recent advance in quotations of spring steel, which is still quotable at 4c. to 6c. per lb., a firmer attitude on the part of the mills will probably result in a slight increase of the warehouse quotations. Cold-rolled shafting and screw stock are this week quoted over a range of 3.90c. to 4.05c. per lb. for rounds and 4.40c. to 4.55c. per lb. for flats, squares and hexagons, the higher price representing an advance of 15c. per 100 lb. over the old quotation. The market is extremely firm, however, and within a few days it is expected that all sellers will be on the advanced basis. Black and galvanized sheets are practically the only items which show weakness. Quotations on these are generally unchanged, but sellers in this district report a slight stiffening tendency as stocks are reduced and mills show greater firmness in prices. Railroad embargoes are undoubtedly interfering with shipments from the mills and one factor in this district reports the sale out of stock of a number of small orders of sheets to other jobbers, whose stocks are reduced to a low level. Wrought iron pipe has been advanced by warehouses from $8 to $12 per ton, as a result of the recent advance of the makers. Sellers of steel pipe report an active demand and many orders for delivery late in the spring. Brass and copper warehouses report no change in prices and business good. We quote prices on page 396.

Cast Iron Pipe.—The market continues strong with both private and municipal buying beginning to increase. One maker in this district reports that he is booked with orders for from three to four months and is offering three to six weeks delivery. Buyers who have delayed improvements awaiting possible lower prices are evidently convinced that the trend of prices in this market is upward and are hastening to issue inquiries and tenders. The Department of Water Supply of Rochester, N. Y., opened bids Jan. 31 on 3000 tons of 6-in. to 12-in. water pipe. On Feb. 7 bids will be opened by the city of Woonsocket, R. I., on about 2500 tons of mostly 30-in. water pipe. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe. Although there is continued activity of jobbers in purchases of soil pipe, stocks are not believed to be large in most cases. Greater severity in enforcement of the railroad embargoes in New England interferes with shipments, but is expected to clear the embargo situation more quickly. Prices are strong. We quote discounts of both Southern and Northern makers, delivered New York, as follows: 2 to 6-in. standard, 23 to 25¾ per cent off list; heavy, 33 to 35¾ per cent off list.

Finished Iron and Steel.—The awarding of two structural jobs totaling 29,000 tons to the American Bridge Co. was an outstanding event of the local steel market in the week. One of these jobs is the new Equitable Building at Thirty-second Street and Seventh Avenue, which will take 18,000 tons, and the other is the Roosevelt Hotel, Madison Avenue and Forty-sixth Street, New York, which will require 11,000 tons. There are many tentative inquiries in the market for steel for apartment buildings. The present tax exemption law on buildings used for dwelling purposes provides that the first floor of such buildings must be completed by April 1, and there will undoubtedly be a rush to get these buildings started soon unless, as may result from present agitation, the law is extended for another year. Prices of plates, shapes and bars hold firmly at 2.10c., Pittsburgh, this appearing to be the minimum, with some quotations $1 or $2 a ton higher. Makers of cold finished steel bars have advanced prices $3 a ton, the new quotation being 2.65c. per lb., Pittsburgh. A few carloads of bar iron have been sold within the week at 2c. per lb., Ptitsburgh, but this price has now practically disappeared, mills quoting 2.10c.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, plates and structural shapes, 2.44c.; bar iron, 2.44c.

Coal and Coke.—The car supply in the Connellsville region has improved and is now about 30 per cent, a decided change for the better having taken place Monday and Tuesday. Prices are slightly easier and furnace grades quotations range from $7.75 to $8.25, while on foundry grades $9.25 to $9.75 is quoted.

Old Material.—The market is a little easier this week, but prices are still holding firm. Eastern Pennsylvania is active, but mills have eased off slightly on prices they will pay. Shipments are going forward to Pottsville, Pencoyd, Coatesville and Claymont, Del. On heavy melting steel equivalent to railroad, $19 per ton has been paid for delivery to Pottsville and on railroad steel $20 per ton Bethlehem is still being paid. Buying prices New York continue unchanged at $16 to $16.50 for No. 1 yard steel and $16.75 to $17.25 per ton for railroad quality. Stove plate is strong and may be quoted at $14.50 to $15.50 per ton based upon shipments to eastern Pennsylvania. A foundry at West Mahwah, N. J., will pay up to $19 per ton delivered. Forge fire is quotable at $13 to $14 per ton. On mixed borings and turnings $18 has been paid for Monessen and $19 for Bethlehem delivery. Specification pipe is strong at $14.25 to $14.75 New York, a mill at Lebanon paying $19 to $19.50 per ton delivered.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$16.00 to $16.50
Steel rails, short lengths, or equivalent	16.75 to 17.25
Rails for rolling	18.00 to 18.50
Relaying rails, nominal	26.00 to 27.00
Steel car axles	19.50 to 20.00
Iron car axles	26.00 to 27.00
No. 1 railroad wrought	18.00 to 18.50
Wrought iron track	16.25 to 16.75
Forge fire	13.00 to 14.00
No. 1 yard wrought, long	17.00 to 17.50
Cast boring (clean)	13.50 to 13.75
Machine-shop turnings	13.50 to 13.75
Mixed borings and turnings	13.50 to 13.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	14.25 to 14.75
Stove plate	14.50 to 15.50
Locomotive grate bars	15.00 to 15.50
Malleable cast (railroad)	16.00 to 16.50
Cast-iron car wheels	18.50 to 19.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$22.00 to $23.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	19.00 to 20.00
No. 1 heavy cast, not cupola size	17.00 to 18.00
No. 2 cast (radiators, cast boilers, etc.)	17.50 to 18.50

Birmingham

Price Trend Is Toward Base of $25 — Wire Mills Heavily Booked

BIRMINGHAM, ALA., Jan. 30.—The minimum on Birmingham pig iron last week was $24. Two smaller producers booked 15,000 to 16,000 tons each for second quarter at that base in a week. One then withdrew all outstanding quotations and advanced to $25 for all delivery and inquiries subject to head office confirmation. The five active merchant iron makers were today on a $25 base for remainder of the second half and making sales on that base. The volume is not yet large, but no other price is being quoted. One Eastern owner of Southern plants booked 4000 tons, second quarter, at $24. More than one maker is dangerously near being overloaded. Rail and river iron has advanced to $24, even having $2 advantage in freight rate. The leading interest is not believed to be interested in the foundry market owing to needs of its own for basic production. It has three stacks on foundry and eight on basic, the report of four on foundry being an error. The Alabama Co. will blow in a second Gadsden stack as close to Feb. 1 as raw material assemblage permits. Oxmoor furnace of the Tennessee company should be ready in 10 days.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry silicon 1.75 to 2.25	$24.00 to $25.00
Basic	23.00 to 24.00
Charcoal, warm blast	32.00

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. has booked 5000 tons for Louisville besides many Western orders. The pressure pipe base is now $44. Business is coming with a rush. Sanitary pipe remains at $60 and the market is strong. The McWane Cast Iron Pipe Co. has increased capital from $100,000 to $200,000. It expects to operate the new shop by March 1. Walter Cater and others, of Anniston, have organized the Independent Soil Pipe Co., taken over the old Ajax foundry and will convert it into a pipe shop. The Talladega Pipe Co. is enlarging its shop. The Pacific Coast will have taken 25,000 tons of pressure and sanitary pipe via Mobile this month.

Finishing Mills.—Wire drawing mills are near the congestion point. They are booked solidly on nails for three months and as far ahead as six months on some products. The Central of Georgia has placed with the Chickasaw Shipbuilding & Car Co. 300 55-ton steel hopper cars, 200 50-ton flat bottom composite coal cars, 100 steel underframe stock cars and 500 ventilator box cars, delivery to begin May 1. It has placed 500 repairs and 100 flat cars and 20 caboose underframes with the Virginia Bridge & Iron Co. Steel bars bring 2.25c. to 2.40c., no change in price having been made in the past two weeks.

Coal and Coke.—By-product coke to replace anthracite coal for domestic use in Chicago and other Western points continues to go in large quantities. Spot coke is strong at $8.50. Coal production is close to the record figures of July and August when the Western emergency demand existed.

Old Material.—Demand and movement of all grades except No. 1 steel are good. The larger local steel melters will not pay over $15 for steel and freight rates prevent its going far afield.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$16.00 to $17.00
No. 1 steel	14.00 to 16.00
No. 1 cast	18.00 to 20.00
Car wheels	18.00 to 20.00
Tramcar wheels	17.00 to 19.00
Stove plate	16.00 to 17.00
Cast-iron borings	9.00 to 10.00
Machine shop turnings	9.00 to 10.00

Buffalo

Lull in Pig Iron—Finished Materials and Scrap Strong

BUFFALO, Jan. 30.—The $28 base on pig iron is still being quoted by most producers still in the market, but this price is sometimes shaded. Furnace operation has been increased by the addition of one stack by the M. A. Hanna Co., operating the Buffalo Union Furnace plant. Inquiries are plentiful but not for any large tonnages; the average is 100 to 200-ton lots. Malleable is quoted at $28.50 to $29 with little demand. Basic is quoted at $28. The largest foundry iron inquiries now engaging producers are two for 1000 tons and one for 2000 tons. While there is a lull, the tone of the market is strong.

We quote f.o.b. per gross ton Buffalo as follows, the higher price being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$29.00 to $30.00
No. 2X foundry, 2.25 to 2.75 sil.	28.00 to 28.50
No. 2 plain, 1.75 to 2.25 sil.	27.00 to 28.00
Basic	27.00 to 28.00
Malleable	28.00 to 29.00
Lake Superior charcoal	33.28

Finished Iron and Steel.—Bar prices are now 2.10c and it is difficult to find mills willing to accept business. One local maker is quoting 2.15c on certain specifications and will only consider business of large tonnage; orders regarded as desirable are not declined. An agency withdrawn on all products except black sheets last week has since filled its books to the point desired on this product and is now out on all iron and steel selling. Buyers freely admit it is not possible to place bar orders at less than 2.10c; several smaller sellers are reported to have quoted as high as 2.25c on extra heavy sizes. Plate inquiry is strong; a user seeking 1000 to 1500 tons has not been able to place it. Wire demand is increasing and the demand for cold-rolled material indicates a stronger market soon. Railroad spikes have been advanced $3 per ton.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.20c.; plates, 3.20c.; soft steel bars, 3.10c.; hoops, 4.10c.; bands, 3.90c.; blue annealed sheets, No. 10 gage, 4.05c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Coke.—Good grades of furnace coke are bringing $8.50 and foundry is $9.50 to $10.000. Domestic is easier.

Old Material.—About 30,000 tons of heavy melting steel have been bought in the district, resulting in one heavy purchaser withdrawing from further activity in the market. Most of the tonnages went at $21, but several sales were at $21.50. The car situation is improved and shipping is easier. The market is strong on all products.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$21.00 to $21.50
Low phos., 0.04 and under	23.00 to 23.50
No. 1 railroad wrought	18.00 to 19.00
Car wheels	22.00 to 23.00
Machine-shop turnings	14.50 to 15.50
Cast iron borings	17.00 to 17.50
Heavy axle turnings	18.50 to 19.50
Grate bars	18.00 to 18.50
No. 1 busheling	19.00 to 19.50
Stove plate	19.00 to 19.50
Bundled sheet stampings	15.50 to 16.00
No. 1 machinery cast	22.50 to 23.50
Hydraulic compressed	19.00 to 20.00
Railroad malleable	23.00 to 23.50

Boston

Quiet Buying Going On, Some of It for the Second Quarter

BOSTON, Jan. 30.—Quiet buying of pig iron is going on, with some for second quarter. Sales the past week approximate 8500 tons, of which fully 5000 tons was taken by a manufacturer of machinery. Details as to this purchase are lacking. At least two makes of domestic, silicon 2.25 to 2.75 and silicon 2.75 to 3.25, are known to have been purchased, with deliveries extending from February well into the second quarter, and prices paid were more or less special. Other transactions involved carlots to a few hundred tons each, with Buffalo, eastern Pennsylvania, Virginia, Alabama, Scotch and resale domestic figuring in the business. Nearly all of them were for first quarter shipment, with average prices on the following furnace base: Buffalo $27.50 to $28; eastern Pennsylvania, $28; Virginia, $27; Alabama, $24 to $25; resale, $28, furnace, Pennsylvania; and Scotch around $30, duty paid, Boston. The Buffalo market is not as steady as it appears on the surface, however, unsolicited offers being made for second quarter delivery at $27, furnace, base with 50c. differentials, to Connecticut foundries. Virginia and Alabama furnaces are getting iron into New England via rail and water routings. The movement from other domestic furnaces having only all-rail routings is decidedly uncertain even when permits are issued. The Maine Central Railroad the past week embargoed Boston & Maine freight, thereby placing some Maine foundries at an even greater disadvantage than heretofore.

We quote delivered prices on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

Eastern Penn., sil. 2.25 to 2.75	$32.15 to $34.65
Eastern Penn., sil. 1.75 to 2.25	31.65 to 33.65
Buffalo, sil. 2.25 to 2.75	32.41 to 33.91
Buffalo, sil. 1.75 to 2.25	31.91 to 32.91
Virginia, sil. 2.25 to 2.75	33.42 to 34.42
Virginia, sil. 1.75 to 2.25	32.92 to 33.92
Alabama, sil. 2.25 to 2.75	34.10 to 35.10
Alabama, sil. 1.75 to 2.25	33.60 to 34.60

Iron Importations.—Receipts of foreign pig iron at this port in the week ending Jan. 27 dropped to 100 tons of Scotch, contrasted with 4241 tons of Belgium and 1500 tons of German, a total of 5741 tons the previous week. Importers in some cases feel the import movement is over for the present, at least. The occupation of the Ruhr district and high prices demanded for Scotch are the two big factors in the foreign iron situation. During the past week, E. Arthur Tutein, Inc., Boston, diverted the Domira with approximately 4000 tons of Belgium iron, and part of the West Noska's 2025 tons of Scotch cargo to Providence, R. I., due to freight congestion at the Army Base, South Boston. Heavy snow early in January and a lack of locomotive power have prevented a free movement of freight not only from the Army Base, but from Commonwealth Pier, Boston & Maine wharfage and other local unloading space. The accumulation of pig iron at the Army Base approximates 20,000 tons, of which better than 5000 tons belong to a Worcester, Mass., steel company. The New Haven Railroad has moved a heavy crane from its Braintree, Mass., shops to the Army Base to facilitate pig iron loadings. Transportation difficulties are not confined to seaboard unloading points. The movement of freight distances of not more than 25 miles is reported to have taken 30 days. In addition to the 100 tons of Scotch pig iron, 530 tons of English ferromanganese landed at this port in the week ending Jan. 27.

Warehouse Business.—The movement of iron and steel, more especially of bars, structural steel and sheets, out of warehouses holds well. Fresh arrivals of stock from mills are filtering into New England slowly, the showing from the Pittsburgh district being somewhat better than from eastern Pennsylvania. Bolts and nuts are in good demand with prices firm. Wire nails and wire goods of all kinds are in limited supply.

Jobbers quote: Soft steel bars, $3.21½ per 100 lb. base; flats, $4; concrete bars, $3.36½; structural steel, $3.21½ to $3.65; tire steel, $4.65 to $5; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.40; hoop steel, $4.90; cold rolled steel, $4 to $4.50; refined iron, $3.21½; best refined, $4.50; Wayne iron, $5.50; Norway iron, $6.60 to $7.10; plates, $3.31½ to $3.53½; No. 10 blue annealed sheets, $4.21½ per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Finished Material.—Local mill representatives for the first time in months find themselves forced to turn down business for the first quarter, due to the sold-up condition of the plants. Prices are strong all down the line with consumers paying less attention to these than to the matter of deliveries, which have slowed up materially because of the congestion at New England gateways. The few New England steel mills are working various departments day and night and are far behind on deliveries. The Wickwire-Spencer Steel Corporation's plants in this territory are employing about 3500 men. The Eastern Steamship Lines, Inc., Boston has awarded a contract for two combined passenger and freight steamers to cost in excess of $3,500,000 to the Bethlehem Shipbuilding Corporation. They will be of steel construction and built at Sparrows Point. The city of Boston has awarded several hundred tons of castings to three bidders, the total cost of which is $38,221.

Coke.—The New England Coal & Coke Co., Boston, continues to quote by-product foundry coke at $16, delivered, within the $3.10 freight rate zone, and the Providence Gas Co., $15. Reports on deliveries by these companies vary, in some instances showing improvement, while in other cases sales agencies are getting less than 50 per cent of requisitions. The demand for Connellsville coke both for domestic and foundry use continues active with prices somewhat easier, but difficulty is experienced in getting shipments through. Connellsville foundry coke can be purchased on a delivered basis ranging 50c. to $1 a ton less than local fuel can.

Old Material.—During the last few days, the old material market was less active due to the completing of some eastern Pennsylvania mill orders. Prices are strong with definite advances of 50c. a ton established on railroad malleable, rolling mill cast iron borings, $1 advances on railroad and yard wrought and wrought pipe, and $1 to $1.50 advances on forged scrap and bundled skeleton. Heavy melting steel is scarce, New England mill takings aggregating nearly 10,000 tons within the past fortnight having cut down available supplies. Certain yards are mixing yard wrought with steel to complete shipments. The largest offer reported is 500 tons at $17 on cars shipping point, which is 50c. to $1 above the market. An equal tonnage of wrought pipe is offered at $15 on cars, the highest price reported since 1920. Round tonnages of other materials are offered, in each instance at prices above the market, this policy helping to slow down business the past few days. Horseshoes are in demand at $16 to $16.50, with few available. Foundries are buying more machinery cast than heretofore, but prices are no higher. The New Haven will accept old material, westbound shipments, and the Boston & Maine

shipments to all but connecting New Haven Railroad points. The movement of scrap out of New England is extremely limited, however, due to a lack of cars.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$22.50 to $23.00
No. 2 machinery cast	20.50 to 21.00
Stove plate	16.50 to 17.00
Railroad malleable	22.00 to 22.50
Bundled sheets	14.00 to 14.50
Car wheels	20.00 to 21.00

The following prices are offered per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$16.00 to $16.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.00 to 15.50
Wrought pipe (1 in. in diam., over 2 ft. long)	13.00 to 13.50
Machine shop turnings, regular	12.00 to 12.50
Cast iron borings, rolling mill	13.50 to 14.00
Cast iron borings, chemical	17.00 to 17.50
Blast furnace borings and turnings	12.00 to 12.50
Bundled forged scrap	13.50 to 14.00
Axles	20.00 to 20.50
Shafting	20.00 to 21.00
Rails for rolling	16.00 to 16.50

Cincinnati

Moderate Activity in Pig Iron—Mostly of Small Tonnages

CINCINNATI, Jan. 30.—Fair activity marked the pig iron market during the past week, and while most of the orders ran from carload lots to 200 tons, some fair-sized sales were reported. An Indianapolis malleable shop bought 2000 tons of malleable from a Cleveland district furnace at a price reported to be a few cents under $27, furnace. A Hamilton, Ohio, melter bought 2500 tons, 1500 Northern and 1000 Southern, the Northern bringing $27.50, Ironton basis, and the Southern $24, Birmingham basis. Another sale of 500 tons of southern Ohio iron was made at $27.50. The Southern market is now pretty well established at $24 for first half, and several furnaces have booked small orders at this figure, while $25 for second quarter has also been paid by melters who prefer certain brands and who are willing to pay the advanced price. It is reported that a small tonnage of resale material is available at about $23.50, Birmingham, and some high silicon iron has been offered at a price which figures back to this base. In the North, the situation appears stronger, and one southern Ohio furnace is now asking $28 for the rest of the first quarter. There is little activity in basic or silvery irons, and ferroalloys have also been dull. Inquiries include 1500 tons of various grades from the Norfolk & Western Railroad, 1200 tons from the Southern Pacific and 500 tons from an Indiana stove maker. There is also a scattering of inquiries for carload lots for prompt shipment.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$28.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	28.55
Ohio silvery, 8 per cent	38.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	29.77
Basic Northern	29.27
Malleable	29.77

Finished Materials.—Consumers seem to be pretty well covered for their immediate requirements of bars, shapes and plates, and last week showed a slight let-up in the demand. On sheets, insistent demand for prompt delivery has sent the price of blue annealed to 2.75c, black to 3.50c and galvanized to 4.50c, and virtually all independent companies are now quoting these figures. Wire products are also in good demand, and some mills are accepting business for nails only when an equal amount of fence is ordered. Deliveries are running further behind, nine weeks being a fair sample of even the best promises on any finished materials. Prices are strong, and 2.10c on bars, shapes and plates is now considered the market, with some mills asking 2.25c on plates for any delivery. Billets are also in good demand, and sales of small lots have been made at $40 to $41 per ton. The general market is quoted at $38.50, but it is difficult to place an order at this figure. There is little activity in the structural field. The only new project to appear is the Third National Bank Building, Dayton, Ohio, on which bids will be asked shortly. Bids have been rejected on the War Memorial Building at Nashville, Tenn. A number of prospective reinforced concrete buildings loom in the offing, for which considerable tonnage of bars will be required. Tank builders are running to capacity.

Warehouse Business.—Following similar announcements from other cities, local jobbers have advanced prices of bars, shapes, plates, reinforcing bars, and hoops $3 per ton. No changes have been made in cold rolled steel, sheets, or wire products. The demand for warehouse shipment is heavy.

Cincinnati jobbers quote: Iron and steel bars, 3.10c. base; reinforcing bars, 3.20c. base; hoops, lighter than No. 12, 4.30c.; bands, 3.85c. base; shapes, 3.20c. base; plates, ¼-in. and heavier 3.20c., lighter 3.35c.; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3.10 per 100 lb.; common wire nails, $3.20 per keg, base.

Coke.—Inquiry is still fairly good for domestic coke and metallurgical fuels are in increasing demand. We note several sales of furnace coke from the Wise County field at around $8, ovens. Prices generally are about the same as last week and some fields are reporting car shortages, which is given as one reason for the steadiness of quotations.

Old Material.—The scrap market activity runs to small tonnages for prompt shipment. Steel plants are not buying, as they feel prices are too high. Dealers are not pushing sales, either, and the market is marking time, awaiting developments in the price situation which consumers and dealers feel to be near. No price changes are reported.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$13.00 to	$13.50
Iron rails	17.00 to	17.50
Relaying rails, 50 lb. and up	26.00 to	27.00
Rails for rolling	18.00 to	18.50
Heavy melting steel	18.00 to	18.50
Steel rails for melting	16.00 to	16.50
Car wheels	20.00 to	20.50
	Per Net Ton	
No. 1 railroad wrought	15.00 to	15.50
Cast borings	12.00 to	12.50
Steel turnings	11.50 to	12.00
Railroad cast	17.50 to	18.00
No. 1 machinery cast	20.50 to	21.00
Burnt scrap	11.50 to	12.00
Iron axles	21.50 to	22.00
Locomotive tires (smooth inside)	15.00 to	15.50
Pipes and flues	12.00 to	12.50

Cleveland

Round Lot of Basic Sold—Active Demand for Plates, Shapes and Bars

CLEVELAND, Jan. 30.—Lake Superior ore shipments during 1923 will be 56,000,000 to 60,000,000 gross tons and probably close to the higher figure, according to the estimate of the representative of a leading ore firm based on data recently collected. This estimate is based on the present pig iron production and the expectation that the present rate will be maintained. With the expectation of a good year, mining companies are getting out about as much ore as they can produce, although operations are curtailed somewhat by the shortage of labor which is expected to grow more acute in the spring when the open pit mines are placed in operation. One ore interest would increase the operation of one of these important mines, now running one shift, to two shifts were men available.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—A moderate volume of activity has developed in foundry iron for the second quarter delivery in districts west of Cleveland, particularly in Indiana, and producers are now generally willing to take on business for that delivery, although some are not actively seeking contracts. Consumers who placed orders during the week include automobile and implement manufacturers, and makers of stoves and heating furnaces. One lake furnace reports sales aggregating 20,000 tons, including one lot well over 5000 tons of foundry and malleable iron. Some inquiries are pending both for the second quarter and for March and April shipment, including one from the Link-Belt Co.,

Indianapolis, for 2000 tons. In this immediate territory, the market was dull. Several consumers have sent out tentative inquiries, but with the announcement of the agreement between the operators and miners, some of the prospective buyers decided to defer purchasing, seeing a possibility of lower fuel costs and perhaps cheaper pig iron. After a quiet spell, some activity has developed in basic iron. One interest reports the sale of a round lot for February-June shipment from a furnace just outside the Valley district at $27.50 at furnace. Coincident with the announcement of this sale is the reported purchase of 20,000 tons of basic iron by a north central Ohio consumer. This sale evidently established the basic market at close to a $27, Valley basis. Two producers have definitely named $28 as their second quarter price on foundry iron, although a limited amount of business has been taken at $28.50. One of these has recently been holding to $29 for the remainder of the first quarter and adheres to that price for early shipment. A Cleveland interest has advanced its price 50c. a ton to $27.50 for foundry iron for outside shipment, which is the price it has been quoting for local delivery. On Southern foundry iron $25 appears to be the lowest price in this territory, although other districts report a $24 price. Several sales of low phosphorus iron aggregating 700 tons are reported at $35.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron includes a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and a $6 rate from Birmingham.

Basic, Valley furnace	$26.75 to $27.00
Northern No. 2 fdy., sil. 1.75 to 2.25	28.00
Southern fdy., sil. 1.75 to 2.25	$30.00 to 31.00
Malleable	28.00
Ohio silvery, nominal, 8 per cent	39.52
Standard low phos., Valley furnace	35.00

Bolts, Nuts and Rivets.—There is a good demand for bolts and nuts from the agricultural implement trade as well as from automobile manufacturers, railroads and jobbers. With improved business, some consumers have found that they will need more bolts and nuts during the first quarter than they have contracted for and are placing additional orders. Present quoted prices are being shaded 10 per cent on desirable orders, the ruling quotation for large machine bolts being 5, 10 and 10 per cent off list. A local manufacturer has taken 700 tons of rivets from an Eastern car builder. Rivet specifications are good. Regular prices are still being shaded $1 to $2 per ton.

Sheets.—The sheet market is very firm with the prices tending upward. There is a shortage of automobile body sheets and a leading car builder is reported to be scouring the country for additional supplies. The Ford Motor Co. has asked mills to make second quarter reservations subject to prices that are established. Other inquiries for the second quarter have come out, but no mills are as yet quoting for that delivery. Some mills have advanced prices on blue annealed sheets to 2.90c. and that price is now being quoted by a local producer for light plates in blue annealed gages. Black sheets can still be had at 3.35c.

Warehouse Business.—A local jobber has advanced blue annealed sheets $3 a ton, but is still under the Steel Corporation price.

Reinforcing Bars.—A large amount of building work requiring reinforcing bars is coming out and the market on these is very firm with 2c. as the minimum quotation for rail steel bars. The Jones & Laughlin Steel Corporation has taken 175 tons for a building for the Ohio Injector Co., Wadsworth, Ohio. Pending inquiries include 750 tons for a building for the Godman Shoe Co., Columbus, Ohio; 100 tons for the Masonic Temple, Warren, Ind.; and 200 tons for a building for the Trumbull Savings & Loan Co., Warren, Ohio.

Finished Material.—The demand for steel bars, plates and structural material continues heavy and mills are turning down considerable tonnage, some being virtually out of the market. With the mills unwilling to take second quarter business and advancing prices, many consumers are apparently placing additional orders for the first quarter for later requirements. Prices continue to stiffen. On steel bars, sales are being made at 2.20c., although 2.10c. is the more common price and 2c. has not entirely disappeared on desirable orders for extended delivery. On structural material, 2.10c. is the common as well as minimum price. Plate prices cover a wide range, starting from a minimum of 2.10c. One local and an Eastern mill have advanced tank plates to 2.35c., at which some good orders have been taken and another local mill is now quoting light plates at 2.45c. On boiler plates, 2.25c. is a common quotation. Some new inquiries have come out for plates for oil cars and tanks and there is a new inquiry for 30 to 40 stills requiring 1500 tons of plates. A Pittsburgh district mill has taken 1800 tons for rebuilding the McKinney Steel Co.'s furnaces, Cleveland. Lake shipyards are figuring on a tentative inquiry for from one to three large freight boats. In the building field, considerable small work is coming out and fabricators' prices are reported to be somewhat firmer. Plans are to come out about March 1 for the Cleveland Public Library requiring approximately 4000 tons of structural material.

Jobbers quote steel bars, 3.06c.; plates and structural shapes, 3.16c.; No. 9 galvanized wire, 3.30c.; No. 9 annealed wire, 2.80c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.65c. to 3.76c.; cold-rolled rounds, 3.75c.; flats, squares and hexagons, 4.25c.; hoops and bands, 1 in. and wider and No. 20 gage or heavier, 3.84c.; narrower than 1 in. or lighter than No. 20 gage, 4.36c.

Coke.—The coal settlement is expected to result in lower coke prices, but a softening in the market is not yet in evidence. More coke is being offered, but owing to the car shortage, shipments have not improved. We quote standard Connellsville foundry coke at $9 to $9.50.

Old Material.—The market is quiet but with the exception of a few grades, prices are firm. A local consumer has held up shipments on machine shop turnings, mixed borings and short turnings, and prices on these grades have sagged about 25c. a ton. A scarcity of heavy melting steel scrap exists at present in the Valley district, and dealers are behind on shipments and are finding it difficult to cover on old orders.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$20.50 to $20.75
Rails for rolling	22.00 to 23.00
Steel rails under 3 ft.	21.25 to 22.00
Iron rails	18.00 to 18.50
Iron car axles	25.00 to 26.00
Low phosphorus melting	21.50 to 22.00
Cast borings	18.00 to 18.50
Machine shop turnings	15.75 to 16.00
Mixed borings and short turnings	16.75 to 17.25
Compressed steel	18.50 to 19.00
Railroad wrought	19.00 to 19.50
Railroad malleable	22.00 to 23.00
Light bundled sheet stampings	16.50 to 17.00
Steel axle turnings	18.00 to 18.50
No. 1 cast	21.00 to 22.00
No. 1 busheling	16.75 to 17.00
Drop forge flashings over 10 in.	15.00 to 15.50
Drop forge flashings under 10 in.	16.00 to 16.50
Railroad grate bars	18.00 to 18.50
Stove plate	18.00 to 18.50
Pipes and flues	15.50 to 16.00

Detroit Scrap Advances

DETROIT, Jan. 30.—All old materials have recorded advances over prices quoted a week ago with automobile cast leading the list. The scarcity of pig iron, low yard stocks, which in most instances cover weekly melting schedules, and the threatening transportation situation combine to cause the melters in this district no end of worry. A tight labor market is another deterring factor and is the keynote in all production schedules. Dealers are showing interest in the offering of one of the largest producers of approximately 3500 tons of turnings, flashings, borings and regular hydraulic compressed for January delivery on a competitive basis. We quote:

Heavy melting steel	$18.00 to $19.00
Shoveling steel	18.00 to 19.00
No. 1 machinery cast	23.00 to 25.00
Cast borings	14.50 to 15.50
Automobile cast scrap	24.00 to 26.00
Stove plate	17.00 to 18.00
Hydraulic compressed	16.75 to 17.75
Turnings	13.50 to 14.50

Philadelphia

Steel Prices Tend Higher—Pig Iron Steady—Scrap Market Is Weaker

PHILADELPHIA, Jan. 30.—Except in steel products the upward trend of prices seems to have been checked. Pig iron is steady but no stronger, while the scrap market has shown signs of a little weakness following an unusually active buying period. Some of the mills have advanced plates, shapes and bars from $1 to $2 a ton. While it is still possible to buy these at 2.10c., Pittsburgh, the number of mills which will take tonnage at this figure for early delivery is limited, and within another week it is possible that 2.15c., if not 2.20c., will become the minimum. The market is clearly pointing to a 2.25c. level for plates, shapes and bars, according to sellers, and they express the hope that it will become stabilized there. One large independent is turning down everything offered at less than 2.20c. Some mills have suggested to their customers that they "get under cover" in the expectation that prices on the major commodities will go to 2.25c. soon.

Pig Iron.—The sale of 20,000 tons or more of Wabana basic pig iron from Nova Scotia to Eastern steel companies at prices several dollars a ton below eastern Pennsylvania basic is the most interesting development of the week. The iron is for delivery over February and March and will probably be mixed by users with domestic iron of low phosphorus content, as the Wabana iron runs as high as 1.60 to 1.80 per cent phosphorus and is very low in manganese. The prices ruling on these sales are reported to be about $21 to $22, Philadelphia. One lot of 5000 tons was under negotiation today, but may not be closed. Whether the sale of this low-priced iron has affected quotations on eastern Pennsylvania basic is not clear, but on sales of two or three thousand tons of basic last week to a Delaware steel maker slightly under $28, delivered, was done on at least a part of the iron. An Eastern subsidiary of the Steel Corporation came into the market Saturday for 5000 tons of basic for March delivery. Foundry iron continues steady at $28 base, furnace. While foundry iron is not gaining strength, it is not weaker, and some of those who believed that foundry iron would reach $30, furnace, in first quarter are revising their predictions, and now believe that prices have about reached the top, barring further difficulties in production and transportation of coke. A good deal of iron sold for shipment into New England is held up by the embargo on the New York, New Haven & Hartford Railroad, and if that is not lifted soon, some of this iron may be offered for sale in districts to which it can be shipped. There has been no pressure for iron in the past week, but there is a fair run of orders of carloads up to 100 or 200 tons. Local importers say that shipments now afloat will about wind up receipts of European iron. This is partly due to the Ruhr situation and partly to higher quotations on English and Scotch irons. Last week's receipts were 13,402 tons as follows: England, 8850 tons; France, 4230; Belgium, 220; Germany, 102.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$28.76 to $29.14
East. Pa. No. 2X, 2.25 to 2.75 sil.	29.76 to 30.14
East. Pa. No. 1X	30.76 to 31.14
Virginia No. 2 plain, 1.75 to 2.25 sil.	32.17 to 33.17
Virginia No. 2X, 2.25 to 2.75 sil.	33.17 to 34.17
Basic delivered eastern Pa.	28.00 to 28.50
Gray forge	28.00
Malleable	31.14 to 31.26
Standard low phos. (f.o.b. furnace)	35.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Foreign Pig Iron

All prices f.o.b. cars Philadelphia duty paid.

Scotch foundry, 2.50 to 3 sil.	$28.75 to $29.25
English foundry, 1.50 to 2 sil.	28.00 to 28.50
English foundry, 2 to 2.50 sil.	28.50 to 29.00
English foundry, 2.50 to 3 sil.	29.00 to 29.50
Continental foundry, 1.80 to 2.50 sil.	28.00
Continental foundry, 2.50 to 3 sil.	28.50
Low phos., copper free, guar. not over 0.035 per cent phos.	28.50 to 29.50

Ore.—An Eastern furnace company has bought about 40,000 tons of Brazilian and Indian manganese ore at 31c. per unit, c.i.f. Philadelphia. This is higher than the market was generally supposed to be, recent intimations being that manganese ore could be bought for 28c. to 29c. per unit. Iron ore receipts from abroad at this port last week were 7300 tons from French Africa and 4273 tons from Sweden.

Coke.—The coke situation is a little easier, blast furnace coke being available this week at $8, Connellsville, which is 25c. to 50c. a ton below prices of a week ago. About $1 a ton higher is quoted on foundry coke.

Plates.—One large Eastern plate mill has advanced its price to 2.15c., and another has gone to 2.20c. While sales of plates have been made within the past week at 2.10c., Pittsburgh, it is uncertain whether this price could be duplicated this week for fairly early deliveries. On account of the inability of Pittsburgh and Youngstown mills to make early shipments, Eastern mills have sold fair-sized lots for shipment into the Central territory at 2.25c., Eastern mill.

Structural Shapes.—Nominally structural shapes may be quoted at 2.10c., Pittsburgh, but it is becoming less easy to obtain satisfactory mill shipments at that figure, and indications are that the market will be at least $1 higher within a week. One large independent is quoting 2.20c., Pittsburgh, and has turned down business offered at lower figures.

Bars.—Steel bars are firmer, and it is difficult to tell just what the minimum is today. Much of the current business is in small lots, on which certain mills are quoting 2.20c. to 2.25c., Pittsburgh. While it is possible that 2.10c. might still be done on desirable tonnages with one or two mills, the indications point to a higher level. Several of the large makers are rather indifferent about new business, having full schedules for two or three months. Some Eastern bar iron makers have advanced prices to 2.15c., Pittsburgh, for merchant bar iron.

Sheets.—An Eastern company has recently booked a good deal of business, mostly in scattered small tonnages, at 2.75c. for blue annealed, 3.50c. for black and 4.50c. for galvanized. For deliveries in first quarter, it is now very difficult to get prices lower than these.

Spikes.—Eastern makers have advanced railroad spikes, 9/16 in. and larger, $3 a ton, and small spikes, ⅜ to ½ in., $5 a ton, the new quotations being 2.90c. per lb. for large sizes and 3.50c. per lb. for smaller sizes, with $2 per ton added for less than carload lots.

Warehouse Business.—Local warehouses have advanced prices of most steel products $3 a ton, the new prices for Philadelphia being as follows:

> Soft steel bars and small shapes, 3.15c.; iron bars (except bands), 3.15c.; round edge iron, 3.35c.; round edge steel, iron finish, 1½ x ½ in., 3.35c.; round edge steel planished, 4c.; tank steel plates, ¼-in. and heavier, 3.25c.; tank steel plates, ⅛-in., 3.47c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.60c.; galvanized sheets, No. 28 gage, 5.75c.; square twisted and deformed steel bars, 3.15c.; structural shapes, 3.25c.; diamond pattern plates, ¼-in., 4.95c.; ⅛-in., 5.15c.; spring steel, 4.25c.; round cold-rolled steel, 3.85c.; squares and hexagons, cold-rolled steel, 4.35c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.25c.; narrower than 1 in., all gages, 4.75c.; steel bands, No. 12 gage to ⅛-in., inclusive, 3.95c.; rails, 3c.; tool steel, 8.50c.; Norway iron, 6.50c.

Old Material.—The edge is off the scrap market and prices on some grades have declined slightly, even while other grades have registered further advances. Eastern mills have bought heavily in the past few weeks and are fairly well covered for the present. As is usual after a period of active buying, a slight reaction has set in, which is due both to the anxiety of many small dealers to ship their material and obtain the high prices ruling and to the lower prices which mills are offering. The most important transaction of the week was the purchase of 8000 tons of No. 1 heavy melting steel by a plate mill at $21, delivered. Other sales have been made at $20.50. It is expected that the embargo on scrap shipments out of New England may be lifted this week by the New York, New Haven & Hartford Railroad, and if this is done a good deal of scrap which has been tied up there will be released, which should bring

easier conditions. No. 1 heavy melting steel is off at least 50c. a ton, but there have been some advances, notably on cast iron car wheels, No. 1 forge fire, machine shop turnings, wrought iron and soft steel pipes and tubes.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$20.50 to $21.00
Scrap rails	20.50 to 21.00
Steel rails for rolling	22.00 to 23.00
No. 1 low phos., heavy 0.04 and under	25.00 to 26.00
Cast iron car wheels	24.00 to 25.00
No. 1 railroad wrought	23.00 to 24.00
No. 1 yard wrought	20.00 to 21.00
No. 1 forge fire	18.50 to 19.00
Bundled sheets (for steel works)	18.00 to 18.50
No. 1 busheling	19.00 to 20.00
Mixed borings and turnings for blast furnace use	17.50 to 18.00
Machine shop turnings (for steel works use)	18.50 to 19.00
Machine shop turnings (for rolling mill use)	18.50 to 19.00
Heavy axle turnings (or equivalent)	20.00 to 20.50
Cast borings (for steel works and rolling mills)	17.50 to 18.50
Cast borings (for chemical plants)	22.50 to 25.00
No. 1 cast	24.00 to 25.00
Heavy breakable cast (for steel plants)	22.00 to 22.50
Railroad grate bars	19.00 to 19.50
Stove plate (for steel plant use)	19.00 to 19.50
Railroad malleable	19.00 to 19.50
Wrought iron and soft steel pipes and tubes (new specifications)	19.00 to 19.50
Shafting	24.00 to 25.00
Steel axles	24.00 to 25.00

St. Louis

Steel Companies Well Supplied with Orders—Warehouse Prices Advanced

ST. LOUIS, Jan. 30.—The Federal Reserve Bank of St. Louis reports that order books of steel plants in the district show a heavy accumulation of business, which in many instances will insure the present pace of activity—from 78 to 86 per cent of capacity—for the next four to six months, a condition that adds strength to the market for pig iron. Melters who received pig iron recently are reordering and are urging immediate shipment. The market is strong at $29 to $30, Chicago, for Northern iron, and $25, Birmingham, for Southern. The St. Louis Coke & Chemical Co. still quotes $30.50 to $31.50 Granite City, its principal sales of the week being 1000 tons of malleable to an Indiana melter, and 1200 tons of foundry iron to a St. Louis melter.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$31.16 to $32.16
Northern malleable, sil. 1.75 to 2.25	31.16 to 32.16
Basic	31.16 to 32.16
Southern fdy., sil. 1.75 to 2.25	30.17

Finished Iron and Steel.—The first change in warehouse prices since Oct. 22 was made this week, when plates, shapes and bars were advanced 15c. per lb., no other changes being made. Fabricators are showing more interest in the market. The Wabash Railway is in the market for first half requirements for wheels and the Mobile & Ohio has asked for prices on an unspecified quantity of wheels.

For stock out of warehouse we quote: Soft steel bars, 3.05c. per lb.; iron bars, 3.05c.; structural shapes, 3.15c.; tank plates, 3.15c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.90c.; structural rivets, 3.85c. per 100 lb.; boiler rivets, 3.95c.; tank rivets, $\frac{7}{8}$ in. and smaller, 55 per cent off list; machine bolts, large, 50 per cent; smaller, 50 per cent; carriage bolts, large, 45 per cent; small, 45 per cent; lag screws, 55 per cent; hot pressed nuts, square or hexagon blank, $2.75; and tapped, $2.75 off list.

Coke.—The demand for coke continues heavy both for foundry and domestic grades, with local by-product ovens well sold up. Considerable coke is now being shipped from Birmingham ovens at $8 to $8.50 f.o.b.

Old Material.—Prices of old material continue to advance. Railroad offerings are light, and very little is coming into this market from the South because of stronger markets in the East. Some heavy buying is in sight for this market, as consumers are well booked with orders.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$20.00 to $20.50
Rails for rolling	21.00 to 21.50
Steel rails, less than 3 ft.	22.00 to 22.50
Relaying rails, standard section	26.00 to 29.00
Cast iron car wheels	26.50 to 27.00
Heavy melting steel	18.50 to 19.00
Heavy shoveling steel	18.00 to 18.50
Frogs, switches and guards cut apart	19.00 to 19.50
Per Net Ton	
Heavy axles and tire turnings	12.50 to 13.00
Steel angle bars	19.00 to 19.50
Iron car axles	27.50 to 28.00
Steel car axles	22.00 to 22.50
Wrought iron bars and transoms	24.00 to 24.50
No. 1 railroad wrought	18.00 to 18.50
No. 2 railroad wrought	17.50 to 18.00
Railroad springs	22.50 to 23.00
Steel couplers and knuckles	22.50 to 23.00
Cast iron borings	11.00 to 11.50
No. 1 busheling	15.00 to 15.50
No. 1 railroad cast	20.50 to 21.00
No. 1 machinery cast	21.50 to 22.00
Railroad malleable	20.50 to 21.00
Machine shop turnings	10.00 to 10.50

San Francisco

More Active Demand for Pig Iron—Building Projects Numerous

SAN FRANCISCO, Jan. 24.—Demand for pig iron has revived considerably during the past two weeks, and it is estimated that business for approximately 5000 tons has been placed. This includes about 4000 tons of Belgian and Scotch iron, and around 1000 tons of English material, for shipment over a period of four months. Prices range from about $30 to $33, ex-ship, coast ports, duty paid, according to grade and terms of sale. The English iron is from the Middlesborough district, and is quoted on a basis not widely different from the others, for round tonnages. It is a low phosphorus material. Lower grades of iron are obtainable at prices somewhat below the $30 level. It appears that both foundries and sanitary manufacturers are anticipating their future requirements, to some extent, because of the firmness of the market, which has been developing lately. Some are expecting an upward trend of prices to become manifest before long. There is no particular change in freight rates from Continental points, the present being 25s., prepaid, but some stiffening in the schedule is expected.

Coke.—Trading in imported material remains quiet, and no considerable tonnage has been placed recently. It is estimated that about 1000 tons have been contracted during the course of the past month. Several vessels are arriving, and with the market well supplied temporarily, no noteworthy business is expected for some time. Some few cars, perhaps from 12 to 14, of domestic coke have been taken recently, indicating a tendency of prices to a competing basis with foreign. Southern bee-hive is quoted around $12, f.o.b ovens, and by-product from $9.50 to $10.

Finished Iron and Steel.—Fundamental conditions continue good in the California section, the volume of construction work, especially, being very satisfactory. This applies particularly to the large centers and their environs, San Francisco and Los Angeles, where commercial buildings, apartment houses and the like are being erected in considerable numbers. In San Francisco there are several more than ordinary jobs in contemplation, among them being the proposed Exposition Building, which will require about 1000 tons of shapes; the 17-story P. G. & E. home on lower Market Street, upon which the foundation work is now being done, and a proposed $2,500,000 hotel building adjoining the Civic Center.

Old Material.—Actual business in scrap is not conspicuous in volume, but prices continue firm, heavy melting ranging from about $13.50 to $14 per net ton, with some special grades of low phosphorus or reusable scrap being quoted in small amounts at around $16. Cast iron scrap remains firm and rather quiet at close to $26 per net ton.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

For additional prices, see page 380

Plates

Sheares, tank quality, base, per lb.....2.10c. to 2.25c.

Structural Material

Beams, channels, etc.....2.10c. to 2.20c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.10c. to 2.20c.
Refined iron bars, base, per lb.....2.75c.

Hot-Rolled Flats

Hoops, ordinary gages and widths, base, per lb..2.75c. to 2.90c.
Hoops, light gage, under 1 in. wide.....3.25c.
Bands, base, per lb.....2.75c. to 2.90c.
Strips, base, per lb.....2.75c. to 2.90c.

Cold-Finished Steels

Bars and shafting, base, per lb.....2.65c.
Strips, base, per lb.....4.50c.

Wire Products

Nails, base, per keg.....**$2.70 to $2.80**
Galvanized nails, 1 in. and over..... 1.50 over base
Galvanized nails, less than 1 in..... 2.00 over base
Bright plain wire, base, No. 9 gage per 100 lb.. 2.45 to 2.55
Annealed fence wire, base, per 100 lb..... 2.60 to 2.70
Spring wire, base, per 100 lb..... 3.35 to 3.50
Galvanized wire, No. 9, base, per 100 lb..... 3.05 to 3.15
Galvanized barbed, base, per 100 lb..... 3.35 to 3.45
Galvanized staples, base, per keg..... 3.35 to 3.45
Painted barbed wire, base, per 100 lb..... 3.00 to 3.10
Polished staples, base, per keg..... 3.00 to 3.10
Cement coated nails, base, per count keg..... 2.20 to 2.30
Woven fence, carloads (to jobbers).....70½ per cent off list
Woven fence, carloads (to retailers).....68 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads..60 and 5 per cent off list
Machine bolts, small, cut threads...50 and 10 per cent off list
Machine bolts, larger and longer....50 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads, 50, 10 and 5 per cent off list
Cut threads.....50 per cent off list
Longer and larger sizes.....50 per cent off list
Lag bolts.....60 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads...50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 per cent off list
Larger and longer sizes.....45 per cent off list
Hot pressed square or hex. blank nuts...$3.25 to $3.50 off list
Hot pressed nuts, tapped..... 3.25 to 3.50 off list
C.p.c and t. sq. or hex. nuts, blank..... 325 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, tapped..... 3.25 to 3.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S...75, 10 and 5 per cent off list
⅝ in. and larger, U. S. S....70, 10 and 2½ per cent off list
Small sizes, S. A. E.....80 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75 and 5 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....**80, 5 and 2½ per cent off list**
Tire bolts.....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws....75 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....80 per cent off list

Rivets

Large structural and ship rivets base, per 100 lb.....$3.00
Large boiler rivets, base, per 100 lb..... 3.10
Small rivets.....65 and 10 to 65 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb.... 2.90c.
Spikes, ½ in. and smaller, base, per 100 lb.... 3.50
Spikes, boat and barge, base, per 100 lb..... 3.50
Track bolts, base, per 100 lb.....3.85c. to 4.50c.
Tie plates, per 100 lb.....2.45c. to 2.60c.
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	49	23½	¼ to ⅜	+11	+39
¼ to ⅜	55	29½	½	22	2
½	60	46½	¾	28	11
¾	64	52½	1 to 1½	30	13
1 to 3	66	54½			

Lap Weld

2	59	47½	2	23	7
2½ to 6	63	51½	2½	26	11
7 to 8	60	47½	3 to 6	28	13
9 to 12	59	46½	7 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	45	28½	¼ to ⅜	+19	+54
¼ to ⅜	51	34½	½	21	7
½	57	46½	¾	28	12
¾	62	51½	1 to 1½	30	14
1 to 1½	64	53½			
2 to 3	65	54½			

Lap Weld, extra strong, plain ends

2	57	46½	2	23	9
2½ to 4	61	50½	2½ to 4	29	15
4½ to 6	60	49½	4½ to 6	28	14
7 to 8	56	43½	7 to 8	21	7
9 to 12	50	37½	9 to 12	16	2

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel

1¾ in.	21½
2 to 2¼ in.	33
2½ to 3 in.	44
3¼ to 13 in.	49

Charcoal Iron

1½ in.	+12
1¾ to 1⅞ in.	+ 2
2 to 2¼ in.	— 8
2½ to 3 in.	—13
3¼ to 4½ in.	—15

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	55	2½ and 2¾-in.	35
1¼ and 1½ in.	47	3 in.	39
1¾ in.	31	3¼ to 4 in.	44
2 and 2¼ in.	31	4¼ in. and 5 in.	36

Hot Rolled

3 in.	41	3¼ to 4 in.	46

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....85 per cent off list
Carbon 0.30 to 0.40, base.....83 per cent off list
Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage	14	2¼-in. O.D. 10 gage	19
2-in. O.D. 11 gage	15	3-in. O.D. 7 gage	34
2-in. O.D. 10 gage	16	1½-in. O.D. 9 gage	13¾
2¼-in. O.D. 12 gage	16	5⅜-in. O.D. 9 gage	53
2¼-in. O.D. 11 gage	17	5½-in. O.D. 9 gage	55

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.	$14.25
8-lb. coating I. C.	9.60	30-lb. coating I. C.	15.25
15-lb. coating I. C.	11.80	35-lb. coating I. C.	16.25
20-lb. coating I. C.	13.00	40-lb. coating I. C.	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.75c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.45c.
Regular auto body sheets, base (22 gage), per lb., 4.70c. to 5.00c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.50c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic	0.315	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)	0.705
Baltimore, export	0.225	Detroit	0.29	St. Paul	0.60
New York, domestic	0.34	Cincinnati	0.29	Omaha	0.735
New York, export	0.255	Indianapolis	0.31	Omaha (pipe)	0.705
Boston, domestic	0.365	Chicago	0.34	Denver	1.27
Boston, export	0.255			Denver (pipe)	1.215

Pacific Coast	$1.50
Pac. Coast, ship plates	1.20
Birmingham	0.69
Memphis	0.385
Jacksonville, all rail	0.50
Jacksonville, rail and water	0.415
New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Old range non-Bessemer, 51½ per cent iron	5.20
Mesabi Bessemer, 55 per cent iron	5.70
Mesabi non-Bessemer, 51½ per cent iron	5.05

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., 55 to 58 per cent iron in dry Spanish or Algerian	11.50c.
Iron ore, Swedish, aver. 66 per cent iron	9.5c. to 10c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus	30c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	29c.
Manganese ore, Brazilian or Indian	33c. to 34c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$7.50 to $8.50
Chrome ore, basic 48 per cent Cr_2O_3, crude per ton, c.i.f. Atlantic seaboard	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	60c. to 70c.

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown

per gross ton

Rolling billets, 4-in. and over	$38.50 to $40.00
Rolling billets, 2-in. and under	39.50 to 41.00
Forging billets, ordinary carbons	43.50 to 47.50
Wire rods, common, soft base, No. 5	47.50 to 50.00
Wire rods, screw stock	$5 per ton over base
Wire rods, carbon	$3 to $10 per ton over base
Wire rods, acid	$15 per ton over base
Sheet bars, Bessemer	39.50 to 41.00
Sheet bars, open hearth	39.50 to 41.00
Slabs	39.50 to 41.00
Skelp, grooved, per lb.	2.10c.
Skelp, sheared, per lb.	2.10c.
Skelp, universal, per lb.	2.10c.

Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton	$43.00
Rails, light new steel base, per lb.	2.15c.
Rails, light, rerolled base, per lb.	2.00c.
Spikes, 9/16-in. and larger, base, per 100 lb.	$2.90
Spikes, ½-in. and smaller, base, per 100 lb.	3.50
Track bolts, base, per 100 lb.	3.75
Tie plates, per 100 lb.	$2.45 to $2.60
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb.	2.25c. to 2.50c.
Bars, rail steel reinforcing base, per lb.	2.00c.
Ground shafting, base, per lb.	3.05c.
Cut nails, base, per keg	$3.00 to $3.15

Automobile Sheets

Prime quality, subject to 15 per cent "seconds" arising. Prices based No. 22 gage Pittsburgh

Regular auto body quality	4.70c. to 5.00c.
Deep drawing auto body quality	4.95c. to 5.25c.
Extra deep drawing auto body quality	5.20c. to 5.50c.
Flat fender, hood, door and apron or splash guard stock	4.95c. to 5.25c.
Crown fender and cowl, deep drawing	5.20c. to 5.50c.
Crown fender, cowl and radiator casing, extra deep drawing	5.45c. to 5.75c.

Sheet Extras

Sheet steel extras for various finishes and qualities, to be added to base price of black sheets (O. P. C. R. & A.)

Bessemer refined	$0.25
Bessemer special	0.50
Blued elbow stock	0.25
Blue range steel	0.70
Blued stove pipe stock, No. 25 ga. and lighter	0.20
Blued stove pipe stock, No. 24 ga. and heavier	0.50
Enameling stock	0.50
Full cold rolled japanning stock	0.25
Full cold rolled blued stove pipe stock	0.40
Full cold rolled blued stove stock	0.60
Full pickled, full cold-rolled and annealed	0.75
Locker stock	0.25
Special locker stock	0.70
Metallic furniture stock.	
Plus 5 per cent for resquaring	1.00
Nickel plating stock, oiled	1.50
Range steel	0.50
Single pickled	0.45
Extra box annealed	0.15
Deoxidizing	0.15
Circle shearing.	
16 gage and heavier	30 per cent
17-19 gage	35 per cent
20-21 gage	40 per cent
Liming	$0.10
Oiling	0.10
Patent leveling	0.25
Resquaring	5 per cent
Roller leveling	$0.10
Deep drawing	0.25
Extra deep drawing	0.50
Bow socket sheets	0.75
O. H. fender and hood	0.25
O. H. crown fender	0.50

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica per ton f.o.b. Illinois and Kentucky mines	$20.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica per ton, f.o.b. Illinois and Kentucky mines	21.50

Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$43.00 to $46.00	$38.00 to $41.00
Ohio	40.00 to 42.00	35.00 to 38.00
Kentucky	40.00 to 42.00	37.00 to 40.00
Illinois	43.00 to 45.00	40.00 to 42.00
Missouri	48.00 to 50.00	38.00 to 43.00
Ground fire clay, per net ton	5.50 to 8.00	

Silica Brick:	
Pennsylvania	42.00
Chicago	47.00
Birmingham	48.00
Ground silica clay, per net ton	7.50 to 9.50
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)	40.00
Chrome Brick:	
Standard size, per net ton	50.00

Alloy Steel

S. A. E. series Numbers	Bars 100 lbs.
2100 (1½% Nickel 10 to 20 per cent carbon)	$3.00
2300 (3½% Nickel)	5.50
2500 (5% Nickel)	8.00
3100 (Nickel Chromium)	4.50
3200 (Nickel Chromium)	6.25
3300 (Nickel Chromium)	8.50
3400 (Nickel Chromium)	7.50
5100 (Chromium Steel)	4.00
5200 (Chromium Steel)	7.25
6100 (Chromium Vanadium bars)	5.25
6100 (Chromium Vanadium spring steel)	5.00
9250 (Silico Manganese spring steel)	4.15
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.25
Chromium Molybdenum bars (0.70-1 Chromium, 0.25—0.40 Molybdenum)	5.25
Chromium Molybdenum spring steel (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.75

Above prices are for hot-rolled alloy steel bars forging quality, per 100-lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2¼-in. sq. there is a size extra of $10 per gross ton; on billets smaller than 2½-in. sq. the net ton bar price applies.

To Consider Safety Codes for Forging, Plate and Sheet Metal Industries

A conference has been called by the American Engineering Standards Committee to determine whether there shall be: 1. A national safety code for the forging industry; 2. A national safety code for plate and sheet metal working. The meeting will be held Saturday, Feb. 17 at 9.30 a. m. in the board room of the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York.

Papers will be read as follows: Accident Experience in the Forging, and Plate and Sheet Metal Industries, by L. L. Hall, assistant secretary National Bureau of Casualty and Surety Underwriters. Commission Experience with Accidents in the Forging, and Plate and Sheet Metal Industries, by M. H. Christopherson, who is deputy commissioner New York State Department of Labor. National Industrial Safety Codes, by S. J. Williams, who is chairman of the safety code correlating committee and chief engineer, National Safety Council.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
Jan.							
24	14.87½	14.50	40.00	8.20	8.10	7.15	6.80
25	14.87½	14.50	39.87½	8.20	8.10	7.20	6.85
26	15.00	14.62½	40.00	8.20	8.05	7.30	6.95
27	15.00	14.62½	....	8.20	8.05	7.35	7.00
29	15.12½	14.75	40.37½	8.20	8.10	7.40	7.05
30	15.12½	14.75	40.37½	8.20	8.10	7.47½	7.12½

*Refinery price; delivered price ¼c. higher.

New York

NEW YORK, Jan. 30.

Prices have advanced decidedly and the markets are very strong. Active demand for copper has forced the price to the highest level since October, 1920. Straits tin has sold at a new high level. Lead is in strong demand with the price tendency higher. Demand for zinc has increased and prices have sharply advanced.

Copper.—The prediction late last year that electrolytic copper would sell at 15c., delivered, by Jan. 1 was not realized until yesterday. The minimum price is firmly established at that level and a very heavy business has been done on prices ranging from 14.75c. to 15c. in the last week. Some estimates are that January sales will equal those made in December, or 250,000,000 to 300,000,000 lb. The demand comes from all quarters, from brass makers to wire producers. The advance has apparently taken some consumers unawares. Some producers are out of the market, while others are asking ⅛c. higher. Foreign demand is also good, particularly from France and England, and it is stated that the Orient, including Japan, is also a buyer. Lake copper is strong at 15.12½c., delivered.

Tin.—The feature continues to be the scarcity of Straits tin, which commands a premium over future delivery of about 25 points. Sales in the week have not been heavy, but a fair business has been done. On Friday, Jan. 26, 300 to 400 tons was sold, spot Straits commanding 40c. and February-March arrival being sold at 39.87½c. Even late shipment from the East went at 40c. Yesterday sales amounted to 100 to 150 tons, with spot metal commanding 40.37½c., which is also the quotation today, the highest price yet established this year or since October, 1920. Most of the buying referred to has been done by consumers. The British market is also strong and Straits tin is either scarce there or closely held. Quotations today were about £3 per ton higher than a week ago, at £186 5s. for spot standard, £187 15s. for future standard, £188 5s. for spot Straits. Considerable interest centers in the monthly statement of tin delivered into consumption for January, due tomorrow. A carefully prepared analysis made by one authority estimates the deliveries at 6000 tons, while others put them at 5500 tons. Arrivals thus far this month have been 6250 tons, with 5603 tons reported afloat.

Lead.—The market is as strong as ever, and while no advance in quotations has been recorded demand continues heavy and the tendency is higher. The leading interest has not advanced its price above 8c., New York, and is reported as taking orders at this level. In the outside market some business has been done as high as 8.20c., New York. There are also reports that there have been other sellers at 8.05c. and 8.10c. Today the statement is made that sales have been made as high as 8.25c. to 8.37½c. The St. Louis market is steadier than the market at this end, and is fairly well established at 8.10c.

Zinc.—A decided change has developed in this market. Both brass and galvanized sheet makers have come into the market, which together with the scarcity of the metal, has forced prices from 6.75c. a week ago to a minimum of 7.12½c., St. Louis, today. The actual level at which prime Western can be bought for February delivery depends upon sellers, some remaining out of the market and some being well sold up, so that the range of the market is between 7.12½c. to 7.20c., St. Louis.

Antimony.—This market is also stronger and Chinese metal in wholesale lots for early delivery is quoted at 7.12½c. per lb., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery, is quoted at 22.50c. to 23.50c. per lb., New York, duty paid, by importers of the foreign product. No quotations by the leading domestic producer are being made public.

Old Material.—The market is a little off this week and business is quiet. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	14.00
Copper, heavy and wire	13.00
Copper, light and bottoms	11.50
Heavy machine composition	11.00
Brass, heavy	9.00
Brass, light	7.25
No. 1 red brass or composition turnings	10.50
No. 1 yellow rod brass turnings	8.00
Lead, heavy	6.25
Lead, tea	5.00
Zinc	5.00

Chicago

JAN. 30.—Buying has been resumed in practically all of the metals and prices have advanced. Antimony alone remains unaffected. The old metals are also stronger and grades of copper, brass and lead have gone up.

We quote, in carload lots, lake copper, 15.25c.; tin, 41.50c. to 42c.; lead, 8.25c.; spelter, 6.85c.; antimony, 8.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 12.25c.; copper bottoms, 10.50c.; red brass, 9.62½c.; yellow brass, 7.50c.; lead pipe, 6.25c.; zinc, 4.75c.; pewter, No. 1, 25c.; tin foil, 27c.; block tin, 34c., all buying prices for less than carload lots.

St. Louis

JAN. 30.—Lead was strong for the week, advancing 0.35c. to 0.45c., at 8c. to 8.05c., carlots, while slab zinc has been steady at 6.85c. to 6.95c., against 6.90c. the previous week. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 3c.; pewter, 15c.; tin foil, 20c.; tea lead, 2c.; aluminum, 9c.

Witherow Steel Co. Will More Than Double Its Capacity

A merger has been effected between the Witherow Steel Co. and the River Front Land Co., and the capital stock of the new Witherow Steel Co. has been increased to $2,800,000 preferred, fully paid and subscribed, and 10,000 shares of common, no par value.

The directors of the new corporation are W. P. Witherow, George H. Flinn, William Flinn, J. C. Dilworth, F. C. Stoeltzing and W. P. Snyder, Jr., with W. P. Witherow, president; George H. Flinn, vice-president; Joseph Dilworth, secretary, and W. G. Watt, treasurer. Otherwise the personnel of the organization remains the same.

It is understood that Dilworth, Porter & Co., Pittsburgh, have bought an interest in the Witherow Steel Co., and are equipping one of their mills to roll under contract with the Witherow Steel Co., the sections developed and patented by the latter company. These additional facilities, together with extensive improvements to the Neville Island plant of Witherow Steel Co., will more than double the capacity of the company. A wide demand for automobile parts and other rolled materials produced by this company, has made this increase in facilities necessary.

PERSONAL

G. H. Clamer, Ajax Metal Co., Philadelphia, has been nominated for president of the American Foundrymen's Association for the next official year. H. B. Swan, Cadillac Motor Car Co., Detroit, has been nominated for vice-president. For directors, to serve three-year terms each, the nominees are: L. L. Anthes, Anthes Foundry, Ltd., Toronto; T. S. Hammond, Whiting Corporation, Harvey, Ill.; Alfred E. Howell, Somerville Stove Works, Somerville, N. J.; C. R. Messinger, Chain Belt Co., Milwaukee; Thomas W. Pangborn, Pangborn Corporation, Hagerstown, Md. The above nominations were made at a meeting of the association's nominating committee, A. O. Backert, chairman, which was held in Cleveland on Jan. 23.

H. F. Mattern has recently been appointed sales manager of the Reading Iron Co., Reading, Pa., to succeed the late E. F. Mishler, whose death occurred on Dec. 11, 1922. Mr. Mattern joined the Reading company in 1911 as a salesman, and was given the New England and Southern territories to cover. His success in this capacity led to his appointment in 1919 as assistant sales manager. From this position during the last three years he has specialized in oil country business covering the Mid-Continent and California oil fields.

H. F. MATTERN

Royal E. Terhune has been placed in charge of the northern New Jersey sales territory of the Uehling Instrument Co., Paterson, N. J., manufacturer of CO_2 recorders and other power plant equipment. He was formerly associated with the Uehling Laboratories.

Harry von Eckermann, manager of the Ljusne-Woxna Aktiebolag, Ljusne, Sweden, manufacturer of charcoal and electric pig iron and steel, is now in the United States and will visit a number of iron and steel plants.

George W. Emlen, Jr., for several years with the Matthew Addy Co., Philadelphia, has severed his connection with that company and has opened an office at 1420 Chestnut Street, Philadelphia, where as Emlen & Co. he will sell and lease industrial properties.

George F. Eldridge, B. Nicoll & Co., New York, has returned to his office, having recovered from a severe attack of pneumonia.

Herbert W. Alden, vice-president Timken-Detroit Axle Co.; Willard Pope, vice-president Canadian Bridge Co.; and Andrew H. Green, Jr., of the Charcoal Iron Co. of America, have been appointed members of a rapid transit commission for Detroit of five members, all engineers.

F. M. Gibson, who formerly represented the Consolidated Steel Corporation in Japan, will represent the Bethlehem Steel Export Corporation at Tokio, as engineer salesman, and is scheduled to leave New York on Feb. 1 to sail from San Francisco on Feb. 8.

At the annual meeting of the stockholders of the Doehler Die-Casting Co., Brooklyn, the following directors were elected: H. H. Doehler, Charles Pack, John A. Schultz, Jr., H. B. Griffin, John Kralund, F. L. Duerk, John L. Pratt, A. P. Sloan, Jr., and E. J. Quintal.

Arthur W. Berresford, vice-president Cutler Hammer Mfg. Co., Milwaukee, has resigned to take an extended rest after 22 years of arduous service as engineer and executive. He plans to devote considerable time to the activities of the various engineering societies of which he is a member and an executive officer. These include the American Institute of Electrical Engineers and American Association of Manufacturers of Electrical Supplies.

J. Warren Ijams, president Inland Malleable Iron & Steel Co., Terre Haute, Ind., has resigned, and has been succeeded by B. A. Scott of Detroit. Mr. Ijams will retain his financial interest in the company but has retired from active management in order to give attention to other business.

S. E. Marks has been appointed director of traffic and shipping for the Westinghouse Electric & Mfg. Co. and will have general oversight of the traffic, shipping and packing activities in all the plants comprising the electric group, including the East Pittsburgh, Pa.; East Springfield, Mass.; Newark, N. J.; Mansfield, Ohio; Cleveland; Trafford, Pa.; Derry, Pa.; South Bend, Ind.; Homewood and Pittsburgh, plants.

W. W. Reddie has been appointed assistant to manager in the industrial department of the Westinghouse Electric & Mfg. Co., and will be in charge of the railroad shop, metal working, machinery manufactures and material handling sections of the department. He was graduated in 1912 from Rose Polytechnic Institute, Terre Haute, Ind., and immediately afterward entered the employ of the Westinghouse company.

E. S. Lammore, test engineer since 1919 of the Lorain, Ohio, works, National Tube Co., has returned to the Westinghouse Electric & Mfg. Co., with which he was affiliated from 1913 to 1919. He will be in charge of controller sales in the industrial department.

Henry T. Chandler, chemical and metallurgical engineer, also formerly research engineer of the Ford Motor Co., and more recently an associate of C. Harold Wills of C. H. Wills & Co., has become associated with the Vanadium Corporation of America as metallurgical engineer, with headquarters in Detroit.

Edward McMaster Mills has resigned as treasurer of the Buffalo Steel Car Co., Buffalo. Floyd M. Wills has been elected to succeed him.

Thomas Reid has been made superintendent and general manager of the Aurora Foundry Co., Aurora, Ill., to succeed his brother, Samuel Reid, who died last November.

E. L. Essley, president E. L. Essley Machinery Co., Chicago, has gone on a pleasure trip to California where he will remain until April. During his sojourn on the Coast he will make a trip to Honolulu.

Lynn McNaughton, general sales manager of the Cadillac Motor Car Co., Detroit, has been elected vice-president and a member of the board of directors. Mr. McNaughton will continue to direct the general sales.

W. Woodward Williams has resigned as assistant to president, Titan Iron & Steel Co., Newark, N. J., to become sales manager Pittsburgh Crucible Steel Co., Pittsburgh. Mr. Williams has had a long experience in the iron and steel industry, both in operating and sales capacities. He was in the operating department of the Carnegie Steel Co. for a number of years and subsequently was affiliated with Bowne-Fuller Co., A. M. Byers Co., Reading Iron Co., and before joining the Titan company was with the Pittsburgh Gage & Supply Co., Pittsburgh.

E. C. Rock, for several years associated with the Columbia Steel & Shafting Co., Pittsburgh, as district manager of sales in Cleveland and latterly in Chicago, has resigned to become Cleveland district manager for Wyckoff Drawn Steel Co., Pittsburgh.

STEEL CORPORATION EARNINGS

Past Year Makes Better Showing than 1921 — Common Dividend Not Earned

The report of the United States Steel Corporation for the last quarter of 1922 shows little change compared with the two preceding quarters. In the second quarter the net earnings were $27,286,945; in the third, $27,468,339, and in the fourth, $27,552,392. In the three months of the quarter there was very little variation, November being the best month. The deficit after paying the preferred and common dividends was $1,375,356, which compares with $1,339,602 in the third quarter. The usual quarterly dividends of 1¾ per cent on the preferred and 1¼ per cent on the common stocks were declared.

The net earnings for the year amounted to $101,647,671 compared with $92,708,827 in 1921. The year ranks, however, as one of low earnings, for in the period since the organization of the Steel Corporation in 1901, there have been only seven other years in which the net earnings were as small. Earnings for the last four years were as follows:

Quarters	1922	1921	1920	1919
First	$19,339,985	$32,286,722	$42,089,019	$33,513,384
Second	27,286,945	21,892,016	43,155,705	34,331,301
Third	27,468,339	18,918,058	48,051,540	40,177,232
Fourth	27,552,392	19,612,033	43,877,862	35,791,302
Net earnings each year	$101,647,671	$92,708,827	$177,174,126	$143,813,219

Earnings for Fourth Quarter

	Earnings Before Charging Interest on the Subsidiary Companies' Bonds Outstanding	Less: Interest on the Subsidiary Companies' Bonds Outstanding	Balance of Earnings
Oct., 1922	$9,274,791	$708,437	$8,566,354
Nov., 1922	10,371,990	708,639	9,663,351
Dec., 1922	10,030,145	707,458	9,322,687
	$29,676,926	$2,124,534	
Net earnings			$27,552,392
Less, charges and allowances for depreciation and sinking funds			12,182,563
Net income			$15,369,829
Deduct: Interest for the quarter on U. S. Steel Corporation bonds		$4,764,386	
Premium on bonds redeemed		275,079	
			5,039,465
Balance			$10,330,364
Add: net balance of sundry receipts and charges			952,982
Total			$11,283,346
Dividends on stocks of the United States Steel Corporation, viz.:			
Preferred, 1¾ per cent		$6,304,920	
Common, 1¼ per cent		$6,353,782	
			12,658,702
Deficit			$1,375,356

COST OF LIVING NO HIGHER

Metals and Fuels Decrease in December—Most Other Items Increase

Wholesale prices in December averaged just the same as in November, according to the information gathered by the Bureau of Labor Statistics, but were 11.4 per cent higher than in December of last year.

Metals and metal products, as a group, declined 1½ per cent during the month, and reached a point only 15.9 per cent higher than a year ago—this, in part due to recent recessions in pig iron. THE IRON AGE composite price for pig iron, at mid-December, was 33½ per cent higher than a year ago, and the composite for finished steel was 15.3 per cent higher than in 1921.

Metals stand liquidated 69.9 per cent of the 1920 peak price excess over 1913—that is, 69.9 per cent of that excess has been wiped out. This liquidation, a year ago, had reached 84.5 per cent, a portion of which has since been lost by price advances in nearly all items. "All commodities" have been liquidated 62 per cent, on the basis of the December figures; a year ago, it was 71.5 per cent.

Index Numbers of Wholesale Prices, by Groups of Commodities

(1913 equals 100)

	1920 Peak	1921 Dec.	1922 Nov.	1922 Dec.	Advance in One Year, Per Cent
Farm products	247	120	143	145	20.8
Food, etc	248	136	143	144	5.9
Cloths and clothing	346	180	192	194	7.8
Fuels and lighting	281	199	218	216	8.5
Metals and metal products	203	113	133	131	15.9
Building materials	300	158	185	185	17.1
Chemicals and drugs	213	127	127	130	2.4
House-furnishing goods	275	178	179	182	2.2
Miscellaneous	208	121	122	122	0.8
All commodities	247	140	156	156	11.4

Refractories Prices Firmer

PITTSBURGH, Jan. 30.—Refractories prices show no special change, but the fact that this month has been one of marked activity and producers have become well filled with orders is reflected in a firmer tone. Shading of prices on fire clay and silica brick has not entirely ceased, but it is not so frequent or so sharp as was the case a short time ago, and it is expected to disappear soon, since there is some question whether manufacturers can maintain working organizations at the plant except by advancing wages. In Pennsylvania, it is pointed out that men cannot be expected to work in the clay pits and brick plants at 36c. per hour, when they can get almost double that in the nearby coal mines. For prices, see page 380.

OBITUARY

WILLIAM NOLL, aged 69, director of the Mahoning Foundry Co., Youngstown, Ohio, and a pioneer foundryman, died on Jan. 23 from pleuro-pneumonia. Prior to the organization of the Mahoning Foundry Co. he was superintendent of the foundry of the William Tod Co., Youngstown, whose plant is now operated by the United Engineering & Foundry Co., Pittsburgh.

LAURENCE FORTUNE, for many years head of the bidding and contract section of the Bureau of Supplies and Accounts, Navy Department, died at his home in Chevy Chase, Md., last Thursday, from pneumonia. Mr. Fortune was well known among iron and steel companies furnishing requirements to the Navy Department.

GEORGE A. TAYLOR, district sales manager at Boston for the Youngstown Sheet & Tube Co., died at his home in that city on Jan. 23, after a comparatively brief illness. Mr. Taylor was born at Boston on Feb. 29, 1856, and had spent his life in the steel business. He began as a boy with the National Tube Co. at Boston, and later was connected with a number of concerns, joining the Youngstown Sheet & Tube Co. in November, 1908, when he was assigned to the Boston office as manager.

JOHN BLACKBURNE GOVAN, sales manager Pike Mfg. Co., Pike, N. H., died suddenly at his home on Jan. 22. Mr. Govan was 53 years old, a native of Cambridge, Mass., and for the past 14 years lived in Pike.

ALFRED STUART, chief engineer Durant Motor Corporation, and for many years identified with the General Motors Corporation at Flint, Mich., died in New York on Monday, Jan. 22.

SAMUEL COMLY, vice-president Russell, Burdsall & Ward Nut & Bolt Co., Port Chester, N. Y., died at his home in that city on Jan. 25, aged 87 years. Born in Byberry, Pa., Mr. Comly had been engaged in the nut and bolt business for more than 59 years. He was at one time village president and head of the Board of Trade.

British Iron and Steel Market

Prices Higher—Fuel and Other Costs Rising—Ruhr Events Cause Many Continental Furnaces to Blow Out

(By Cable)

LONDON, ENGLAND, Jan. 30.

Pig iron is strong on increased home and export demand. Prompt supplies of the better grades of Cleveland iron are unobtainable, as the works are fully booked up to February. Increased fuel costs are preventing an expansion of the rate of output.

Hematite is firm and dearer, but cheaper than foundry iron, and increased sales are expected. Best Bilbao Rubio is held at 24s. ($5.57) c.i.f. Tees.

Steel is strong, with an upward tendency and increased sales. Dislocation of Continental markets and exchanges has resulted in a large volume of inquiries coming here, including a line of 10,000 tons of ship plates from Holland. Plate and sheet makers are filled up for three months. The home trade is buying constructional and engineering material.

Few Continental quotations are offering. There is good demand, but business is practically suspended. German heavy rails are being quoted at £7 15s. ($35.96) f.o.b.; German wire rods at £9 5s. ($42.92) f.o.b. Czechoslovakian wire rods are held at £9 ($41.76) f.o.b.

How Ruhr Invasion Has Curtailed Blast Furnace Operations on Continent

Invasion of the Ruhr has caused the following blast furnace curtailments:

In Lorraine, de Wendel at Hayange and Moyeuvre has blown out six furnaces. Knutange has blown out two. There has been no restriction yet by Rombas, but blowing out is contemplated. There is slackening at Hagondange, while at Thionville two furnaces have been banked. Uckange has blown out one and Homecourt is working on a reduced scale. In Meurthe-et-Moselle two furnaces have been blown out by La Providence at Rehon, and Chiers has blown out two at Longwy. Fires have not yet been drawn by Pont-a-Mousson, but operations have been cut down and one furnace banked at Moulaine.

In Luxemburg, Arbed and Terres Rouges have blown out five furnaces. Belgium has hardly been affected as yet, as is the case also with the Saar Valley. In Germany, work is apparently unaffected.

Tin plate has an upward tendency; June shipment on option contracts having been sold at 21s. 3d. ($4.93) basis, f.o.b., and stock plates are being sold at 21s. ($4.87) basis, f.o.b. Exports are moderate, including an oil order from America. Tin plate bars are being "talked higher" and supplies practically are unobtainable at current prices.

Galvanized sheets are firm with large demand from all markets. Works are heavily sold out.

There is persistent demand for Far East specifications in black sheets. Supplies are being sold at £16 10s. (3.42c. per lb.), f.o.b.

We quote per gross ton, expect where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.64 per £1, as follows:

Durham coke, delivered	£1	12½s.				$7.54
Cleveland No. 1 foundry	5	7½				24.94
Cleveland No. 3 foundry	5	5				24.36
Cleveland No. 4 foundry	4	15				22.04
Cleveland No. 4 forge	4	10				20.88
Cleveland basic	4	5				19.72
East Coast mixed	4	17½				22.62
Ferromanganese	15	0				69.60
Ferromanganese*	14	0				64.96
Rails, 60 lb. and up	8	0	to £8	5s.		37.12 to $38.28
Billets	7	0	to 8	0		32.48 to 37.12
Sheet and tin plate bars, Welsh	7	13¾	to 8	1		35.67 to 37.35
Tin plates, base box	1	1	to 1	1½		4.87 to 4.99

					C. per Lb.
Ship plates	£8	15s.	to £9	0s.	1.81 to 1.86
Boiler plates	11	0	to 11	10	2.28 to 2.38
Tees	9	5	to 9	10	1.92 to 1.97
Channels	8	10	to 8	15	1.76 to 1.81
Beams	8	5	to 8	10	1.71 to 1.76
Round bars, ¾ to 3 in.	9	5	to 9	15	1.92 to 2.02
Galvanized sheets, 24 g.	18	10	to 19	0	3.83 to 3.94
Black sheets, 24 gage	12	15			2.64
Black sheets, Japanese specifications	15	5			3.16
Steel hoops	11	0	& 11	10*	2.28 & 2.38*
Cold rolled steel strip, 20 g.	22	2½			4.58
Cotton ties, Indian specifications	15	0			3.11

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:						
Belgium, Feb., Mar.	£4	2½s.	to £4	5s.	$19.14	to $19.72
Luxemb'g, Feb., Mar.	4	2½	to 4	5	19.14	to 19.72
France, Feb., Mar.	4	2½	to 4	5	19.14	to 19.72
Billets:						
Belgium, not quoted.						
France, not quoted.						
Luxemburg, not quoted.						
Wire rods, 5 mm. (0.2 in.):						
Belgium	7	5	to 10	7½	33.64	to 48.14
Wire nails (keg basis):						
Germany	0	14½			3.36	
Belgium	0	20½			4.76	
Angles:					C. per Lb.	
Belgium	7	7½			1.53	
Tees:						
Belgium	8	5			1.71	
Merchant bars:						
Belgium, Apr., May	7	5			1.50	
Luxemburg, not quoted.						
France, not quoted.						
Germany, not quoted.						
Joists (beams):						
Belgium, Feb., Mar.	6	2½	upward		1.27	
Germany, not quoted.						
Channels:						
Belgium	7	10	to 7	12½	1.55	to 1.58
¼-in. plates:						
Germany, Apr.	7	10			1.55	
Belgium, not quoted.						
Luxemb'g, Feb., Mar.	6	15			1.40	
France, not quoted.						
No. 8 gage wire:						
Belgium	14	10⅝			3.01	

Price Tendency Firmer—Effect of Ruhr Occupation—Order for River Barges Placed in France

LONDON, ENGLAND, Jan. 11.—Cammell Laird & Co. are reported to have secured an order from the Central Argentine Railway for 200 steel cars and 140 covered cars, while Hawthorne Leslie, at Newcastle, has received an order from the East Indian railroad for 15 large superheated freight locomotives. It is stated that extensive alterations are being made at Guest, Keen & Nettlefolds works at Dowlais. A large new electrical plant is to be constructed and tenders are under consideration for a new set of coke ovens. On the other hand an unusual circumstance is reported in an important order sent to France from an English shipbuilding concern for steel river barges. It is said to be the first time that an order of such a nature has been sent from England to French shipyards.

Meanwhile orders for vessels of various sizes and descriptions are repeatedly being reported as placed with yards either in the North of England or on the Clyde. The shipbuilding industry is one which has witnessed great depression since 1920, with a heavy percentage of unemployment, but during the latter half of 1922, distinct signs of improvement have been perceptible and the figures issued by Lloyds' Register for the quarter ended Dec. 31 give some tangible evidence that the severe depression is lifting. The tonnage of vessels commenced during the past three months shows an increase of 148,759 tons, compared with the preceding quarter. Of course the recovery can only be very gradual but the fact that things have taken a turn is distinctly encouraging.

The annual meeting of the Eye Sight Conservation Council of America will be held in New York, Feb. 6. Secretary James J. Davis of the U. S. Department of Labor and Prof. F. C. Caldwell of the department of electrical engineering, Ohio State University, have been elected directors of the council.

Plans of New Companies

The Simmons Machine Tool Corporation, with branch offices at 182 Lafayette Street, New York, and 88 Exchange Street, Buffalo, and central offices at 981 Broadway, Albany, N. Y., was recently incorporated with authorized capital stock of $1,500,000 to take over the business of the Simmons Machine Co. of Albany. No changes will be made in personnel and the business will be continued as before. Plans are being prepared for the construction of a two-story plant, 120 x 180 ft., for rebuilding and refinishing machine tools. Two traveling cranes will be installed, one of 30-ton and one of 10-ton capacity.

The Universal Rotary Soil Cultivator Co., 220 Broadway, New York, has been incorporated with capital stock of $100,000 to manufacture soil cultivating machines and other agricultural implements. N. Giusto, an Italian inventor, has designed a cultivator which is still going through the process of experimentation, and if proven successful, will be the chief product manufactured. Under the present plans about three months will be consumed in organization, at the end of which time the company expects to erect a building and install equipment for manufacturing. The officers of the company are N. Giusto, president; I. Sangiorgio, vice-president; N. Della Fazia, secretary; and A. Pinzon, treasurer.

The Associated Spring Corporation, New York, has been incorporated with authorized capital of $5,500,000 to manufacture metal springs, spring beds and kindred products. Philip F. Barnes, 18 Main Street, Bristol, Conn., is one of the principals, and he with F. E. and H. C. Whittlesey are the incorporators.

The Minute-Man Wheel Co., Dover, Del., has been incorporated with capital stock of $500,000 to manufacture automotive equipment and supplies. Beyond the fact of incorporation, however, nothing has developed. The company expects to be in a position to announce its plans within a month. Address care of Charles Haldane, 1974 Broadway, New York.

The Seaman Safety Bracket Corporation, Rochester, N. Y., which was recently incorporated with capital stock of $30,000, will manufacture hardware products, particularly safety brackets. Contracts have been awarded for all manufacturing. The incorporators are F. A. Seaman, president; H. A. Irrig and J. D. Devisser.

The Pittsburgh Welding Co., 40 Water Street, Pittsburgh, has been incorporated in Pennsylvania with capital stock of $50,000. It will take over the business of the Pittsburgh Welding Co., a partnership which is engaged in job welding, also engaging in the manufacture of special tanks, gear guards, insulated and water-cooled furnace doors, and specialties in structural steel and plates. Address John M. Fouse, 2 Wellington Apartments, Pittsburgh.

The Reading Machine & Tool Co., 437 Washington Street, Reading, Pa., was recently incorporated with capital stock of $25,000 and will take control of an existing business which will be continued as manufacturers' agent and jobber of metal and woodworking machinery and tools, electric motors, industrial furnaces, etc. No change will be made either in personnel or operation. The principals are George F. Kaufmann and W. H. Kaufmann.

The Wolke Battery Mfg. Co., Dover, Del., (attention A. F. Wolke, care of United States Corporation Co., Dover, Del.) was recently incorporated to manufacture electric storage batteries and equipment. It is inquiring for new electrical equipment, lathes, drills, motor generators, etc., amounting to approximately $25,000.

The Davis-Murray Motor Co., Inc., 1925 Union Avenue, Altoona, Pa., was recently incorporated with a capital stock of $400,000, to manufacture automobiles. However, no manufacturing is being contemplated at this time, the company acting merely as distributor of Chevrolet cars.

The Brake Service Corporation, 418 Beaubien Street, Detroit, has been incorporated with authorized capital of $25,000 to manufacture automobile brakes and equipment. Plans do not provide for any manufacturing in the near future, the activities of the company being confined to inspecting, adjusting and relining automobile brakes on cars and trucks. The station at the above address is the first of a series which will be located at various points in Detroit. R. P. Henderson, president.

The De Luxe Art Metal Corporation, care of S. M. Newman, 63 Park Row, New York, has been incorporated with capital of $20,000 to manufacture metal specialties and novelties. The company is still going through the process of organization and plans for the future are indefinite. The incorporators are W. A. Michaels, W. and H. Cohen.

The General Alloy Co., (care of D. P. Siegel 120 Broadway, New York) was recently incorporated with authorized capital of $100,000 to manufacture metal alloys. It has a fully equipped plant and is manufacturing general metals. The incorporators are D. and I. M. Rosen, and R. Siegel.

The Bijur Lubricating Co., New York, has been incorporated with capital stock of $501,000 to manufacture lubricating devices and equipment for automobiles. The principal incorporators are connected with the Bijur Motor & Appliance Co., Hoboken, N. J., which has manufactured motor generators and starters for nearly 10 years.

The Walker-LaFrance Motors, Inc., has been organized to take over the assets and business of the Ward LaFrance Motor Co., recently purchased at receiver's sale. Officers will be located at 1819 Broadway, New York, and factory at Elmira, N. Y. The company is engaged in manufacturing and selling Ward LaFrance heavy duty motor trucks, with present capacity of about 50 trucks per month. A service station has been provided at 604 West 138th Street, New York, to do maintenance work. To secure additional capital the corporation is offering $125,000, 10-year 7 per cent debenture bonds through the Gotham National Bank of New York. The officers report sufficient orders on hand to carry through the first three months of 1923. R. W. Walker is president of the company and Ward LaFrance is vice-president, in charge of engineering and production.

Trade Changes

J. A. HAGAR

D. S. Brisbin, general sales manager Columbus McKinnon Chain Co., manufacturer of Dreadnaught tire chains, has announced that beginning Jan. 1, J. A. Hagar becomes Chicago district sales manager covering Illinois, Wisconsin, Minnesota, North Dakota and Nebraska, having charge of sales of heavy and industrial chains. He is located at 1504 Fisher Building, 343 Dearborn Street, Chicago. Mr. Hagar's previous experience affords a wide knowledge in this line. Upon leaving school he took up railroad work and spent several years in the engineering and transportation departments of the Atchison, Topeka & Santa Fe, and Missouri Pacific Railroads. He gave up railroad work in August, 1900, to go into the sales department of the Westinghouse Air Brake Co., and from January, 1905, to 1908 was salesman with the Rail Joint Co., Chicago. He next went with the Lackawanna Steel Co. as special sales representative of the railroad department, and in January, 1911, was appointed district sales manager of the Buffalo district of that company, and held that position until last October.

The Dodge Sales and Engineering Co., Mishawaka, Ind., which for the past eight years has been selling subsidiary of the Dodge Mfg. Co. and Dodge Steel Pulley Corporation, has been consolidated with the parent company, the Dodge Mfg. Corporation, which was organized and began business last July, when it acquired the Dodge Mfg. Co., organized in 1880, and the Dodge Steel Pulley Corporation, organized in 1917 to succeed the Oneida Pulley Co., which dates back to 1900. Hereafter, distribution will be handled through the sales department with Duncan J. Campbell as general sales manager. W. W. French will be in charge of the advertising department. The corporation manufactures heavy oil engines and power transmission appliances, including iron, steel and wood pulleys, pillow blocks, hangers, etc.

The Standard Tool & Mfg. Co., has moved its office and plant from 512 East Lafayette Boulevard to 2435 Scotten Avenue, Detroit.

The Century Electric Co., St. Louis, single and polyphase motors, has opened an office at 603 Queen and Crescent Building, New Orleans, La.

The Welter L. Flower Co., St. Louis, district representative of the Conveyors Corporation of America, has changed its name to the Stewart-Thill Co., 312 Eighth Street. No change was effected in personnel.

The Northern Engineering Works, electric crane and hoist builder, Detroit, announces the following changes in address of sales offices: 30 Church Street, New York, in charge of H. C. Rood; 51 Estey Building, Philadelphia, in charge of John H. Bricker; 53 West Jackson Boulevard, Chicago, in charge of M. H. Haeger, Abell-Howe Company; 606 Pontiac Building, St. Louis, in charge of J. S. Davidson.

The La Porte Machine & Tool Co., La Porte, Ind., has purchased patent rights on the die filing machine heretofore manufactured by the Johnson & Biddle Tool Co., Elkhart, Ind.

The Newton Steel Co., Youngstown, Ohio, has leased quarters on the ninth floor of the Stambaugh Building, Youngstown, now occupied by the Brier Hill Steel Co., and will move from its present location in the Wick Building. The change will not take place, however, until the quarters

are vacated by the Brier Hill company, which has been taken over by the Youngstown Sheet & Tube Co.

The Hanna Engineering Works, 1765 Elston Avenue, Chicago, manufacturer and distributer of Hanna riveting machines, air hoists, sand sifters, molding machines and sprue cutters, is now represented in Detroit and surrounding territory by the Charron Engineering Sales Co., 1002 Real Estate Exchange Building, Detroit.

Announcement has been made of the sale of the Perkins Structural Steel Co. plant at Flint, Mich., to the Massillon Bridge & Structural Steel Co., Massillon, Ohio. After closing the deal, President E. Rice said that the plant will be operated immediately in connection with the main plant at Massillon. By arrangement the Perkins company will complete all contracts at the Flint plant. The main plant at Wooster, Ohio, was not included in the sale.

The Barrett-Christie Co., 37 South Clinton Street, Chicago, has been appointed Chicago agent for the Victor Hack Saw Co., Middletown, N. Y. The company has also been given the distribution in Chicago and vicinity for the products of the Lumen Bearing Co., Buffalo.

The Inland Engineering Co. has opened offices at 6 North Michigan Avenue, Chicago, for the sale of manganese steel and chrome steel castings. Walter S. McKee, president and treasurer, has been in the manganese steel foundry business for the past 18 years, first with the American Brake Shoe & Foundry Co., and latterly as vice-president and director of the American Manganese Steel Co. Other officers include Edward S. Black, Eugene C. Bauer, and John W. Plant, vice-presidents; Alfred H. Exton, chief engineer, and Claude Rorabeck, consulting engineer. All of these men have had considerable experience in the manganese steel castings business.

The Consolidated Machine Tool Corporation, with executive offices at New York, has opened up an additional sales office and store at 1956-60 North Broadway, St. Louis, Mo., in charge of J. B. Corby, formerly of the Corby Supply Co., St. Louis.

R. R. Gore, formerly manager of the supply department, of the Fairbanks Co., Baltimore, Md., has organized the Sales & Engineering Co., 14 South Broadway, Baltimore, and will act as Baltimore and Washington agent for the New Process Twist Drill Co., Taunton, Mass., and other lines.

Edward Law has withdrawn from the partnership, Ernest Law & Co., coal, coke, ore, iron and steel, Harrison Building, Philadelphia. John MacIntyre Jaycox will continue the business, trading as Ernest Law & Co.

The Atlas Vise Co., Lowville N. Y., announces that it will include as a side line to its regular vise business the sale of all kinds of machinery and equipment throughout northern New York. It will consider taking agencies in this territory for engines, boilers, pumps, shafting, garage equipment, etc. E. W. Hutton is president.

The Combustion Engineering Corporation, 43 Broad Street, New York, has acquired the Quinn Oil Burner & Torch Co., W. R. Quinn, formerly president of the Quinn company, becoming associated with the corporation as manager of the fuel oil department. The Combustion Engineering Corporation is now able to furnish a complete line of oil burning equipment, including pump sets, tanks, etc., and is prepared to furnish engineering service incident to the installation of the equipment.

The Brown Hoisting Machinery Co., Cleveland, has appointed the Mackintosh Engineering Co., Schofield Building, Cleveland, agent for small cranes, buckets and storage bins in Ohio, excepting Hamilton County. (Cincinnati)

The Michigan Bolt & Nut Works, Detroit, recently merged into the American Bolt Corporation, announces that all invoices for shipments made prior to Jan. 1, will be paid by F. S. Bigler, foot of Meldrum Avenue, Detroit. Invoices of Jan. 1 and thereafter should be rendered in triplicate with prices to the American Bolt Corporation, same address.

The Uehling Instrument Co., Paterson, N. J., has appointed the Mine & Smelter Supply Co., El Paso, Tex., as exclusive representative for CO_2 recording equipment and other power plant recording instruments in Arizona, New Mexico, and West Texas, as well as in Mexico, north of Mexico City.

L. D. Adams, manufacturers' agent, 204 Seitz Building, Syracuse, N. Y., handling foundry equipment and supplies, has opened a branch office at 514 Brisbane Building, Buffalo, to be supervised by A. S. Kenyon, who recently severed his connection with the Denn Forge Co., Muncie, Ill., and who prior to that was with the sales department of the General Drop Forge Co., Buffalo.

The Ohio Electric & Controller, Co., Cleveland, announces the appointment of the Southern Industrial Engineering Co., Inc., American Trust Building, Birmingham, Ala., as representative for the sale of Ohio magnets in Alabama.

Industrial News Items

Work is under way on a new $700,000 building for the Westinghouse Electric & Mfg. Co. at West Pershing Road and Leavitt Street, Chicago to be used for a combination district sales office warehouse and service shop. It is the first of three buildings to be erected at this location. It will be seven stories and will contain 218,000 sq. ft. of floor space.

The Solvay Process Co., which installed 24 Uehling CO_2 recording and indicating units in its Syracuse, N. Y., plant last October, has just ordered eight additional similar units from the Uehling Instrument Co., Paterson, N. J., for its boiler plant at the same works.

President Franz, of the Algoma Steel Corporation, Sault Ste. Marie, Ont., announces that operations will be resumed soon after Feb. 18.

The Springfield, Ohio, plant of the Ohio Steel Foundry Co. will be rushed with work for the next few months. An order for light castings for 26 locomotives has been received from the Lima Locomotive Works. This order for engines came to the Lima works from the Union Pacific Railroad Co.

The American Seeding Machine Co., Springfield, Ohio, has booked an order for 30 tractor hitch drills from Russia. This is the first order received by the company from Russia in nine years.

The number of common stockholders on the books of the United States Steel Corporation at the close for the December dividend was 93,789, representing a loss of 2518 within three months, and 13,650 during 1922. The number of preferred stockholders at the closing of books for the November dividend was 79,469, whereas in August, 80,931 received the preferred dividend and in November, 1921, 81,621. Average holdings of common stock in December were about 54.2 shares, against 52¾ in September, about 51 in June and 47½ in March, 1922.

Will Liquidate Carbon Steel Co.

On recommendation of a committee which has been investigating the feasibility of receivership or liquidation, it was decided at a meeting of the directors of the Carbon Steel Co., held in Pittsburgh, Jan. 23, to dissolve the company and liquidate its assets. As stated in THE IRON AGE, Jan. 18, 1922, the company is capitalized for $5,000,000, consisting of $3,000,000 common stock, $500,000 first preferred and $1,500,000 second preferred, and has bonded debt of $1,700,000, this being made up $1,200,000 in notes held by one Pittsburgh bank and a mortgage of $500,000 held by another Pittsburgh bank on the blast furnace of the Kittanning Iron & Steel Mfg. Co., Kittanning, Pa., which Carbon Steel Co. controls through a 51 per cent ownership of the stock. This interest in the Kittanning company forms the collateral behind the $1,200,000 of notes.

Plants of the Carbon Steel Co. and its subsidiaries have been idle most of the time since early 1919. The plant site of the Carbon Steel Co. at the foot of Thirty-second Street, Pittsburgh, has a high valuation and it also owns the old fair grounds of 125 acres opposite the plant of the Kittanning Iron & Steel Mfg. Co., Kittanning, Pa., on the Allegheny River. The company owns 1500 acres of coal land at Kittanning. These holdings, together with its interest in the Kittanning company, constitute the principal assets and the return from their sale probably will be sufficient to pay off indebtedness and leave something for the preferred stockholders.

Trumbull Steel Co. Finances

Plans for the financial reorganization of the Trumbull Steel Co. at Warren, Ohio, will be presented on Feb. 6 to stockholders at the annual meeting, President Jonathan Warner has announced. The company plans to issue no-par value common stock instead of its present $25 par value common and to increase its preferred capitalization. The increase in preferred, according to Mr. Warner, will be to retire preferred stock of the Liberty Steel Co., a subsidiary, which is to be dissolved.

The proposal is to increase the preferred authorization from $10,000,000 to $15,000,000 and to authorize 1,500,000 shares of no-par common. Of the new preferred, about $1,000,000 will be required to retire the preferred stock of the Liberty Steel Co.

The company has at present 1,000,000 shares of $25 par value common, of which 520,000 shares are outstanding. The present common will be exchanged share for share for the new common, while the balance will be held in the treasury for sale to employees and for such other purposes as the directors may see fit. Dissolution of the Liberty Steel Co. will mean a substantial saving in corporate costs and eliminate the necessity of keeping separate records and a separate set of books.

Machinery Markets and News of the Works

BUSINESS IN FAIR VOLUME

Automobile Companies and Railroads Are Principal Buyers

Cleveland Market Active—Orders for January About Equal to December Sales Records

While January did not show the gain in machine-tool buying over December that was expected it has proved a fairly good month, and prospects for business are multiplying. The automobile companies and the railroads continue as the principal buyers, but companies in other lines of industry are coming into the market in greater numbers, though their purchases are usually confined to small amounts.

The Cleveland market appears to be the most active as regards prospective business. One large inquiry being figured on comes from the Clayton & Lambert Co., Detroit, which asks for 23 metalworking tools and a few woodworking machines. The Kent, Ohio, Board of Education has purchased a number of tools for school use. Rubber tire companies are active buyers, especially the Goodyear Tire & Rubber Co.

Demand for automatic machines from the Detroit automobile trade is good, and orders for lots of machines ranging from 15 to 20 are in prospect.

At Chicago, some of the large automobile companies continue to come into the market for tools, among them the Studebaker Corporation, the Nash Motors Co., the Continental Motors Co. and the International Harvester Co. The Chicago, Burlington & Quincy Railroad has placed further orders which were left-overs from its recent lists. The Missouri Pacific is expected to place orders this week on its recent list of 53 tools. Other railroad business includes a list of a few tools from the Atchison, Topeka & Santa Fe. The Omaha, Neb., Board of Education has issued an inquiry for 30 motor-driven tools for manual training work.

The principal buying at Pittsburgh is by the National Tube Co., which is still selecting machines for its new plant at Gary, Ind.

It develops that the axle work at the plant of the New Process Gear Co., Syracuse, N. Y., for the Durant Motor Co. will be done by the Adams Axle Co., Findlay, Ohio, which is expected to buy some new equipment, but probably not as much as was at first expected.

A new export possibility for American machinery companies develops from a contract placed by the Brazilian War Department with the Tropenas Co., Brooklyn, as consulting engineers to rehabilitate the arsenal at Rio de Janeiro.

New York

NEW YORK, Jan. 30.

THERE have been no striking developments in the local machine-tool market the past week, but business continues at a fair pace, mostly in small orders. Dealers and sales representatives of tool builders are finding some difficulties in selling new tools since the recent advances in prices on some lines, and many users are giving renewed consideration to used tools. The axle work for the Durant Motor Co. will be done by the Adams Axle Co., Findlay, Ohio, which will occupy the former plant of the Monarch Typewriter Co. at Syracuse, N. Y., now owned by the New Process Gear Co., a Durant interest. At first it was reported that purchases of machine-tool equipment would total several hundred thousand dollars, but the latest information is that the requirements will be very much less than that. Miscellaneous purchasing by railroads and equipment shops continues, but no large lists are up in the East. A carwheel works at Pittsburgh has bought four vertical carwheel lathes. The Davenport Locomotive Works, Davenport, Iowa, has bought a 79-in. driving-wheel lathe.

While the number of current crane inquiries increases, few orders are as yet being reported. Competition is evidently keen, despite improvement in the volume of inquiry, and there are reports of low prices being made on some orders placed. There are a fair number of inquiries for locomotive cranes, but few orders are noted this week. Buyers are said to show an interest in used equipment, but so few used locomotive cranes are available that they will probably buy new. The four locomotive cranes under consideration by the Quebec Development Co., at Charlotte, N. C., probably will not be purchased before the first week in February. As these cranes are for shipment into Canada, the purchase price will be increased by about 33 per cent sales tax and duty.

Among recent purchases are:

Phoenix Utility Co., 71 Broadway, New York, a 20-ton, 18-ft. span hand power crane from the Reading Chain & Block Corporation, through Arthur Appleton, 29 Broadway, New York. A 60-ton electric crane is still pending.

National Lead Co., Oakland, Cal., a 3-ton, 72-ft. 6-in. span overhead traveling crane from the Milwaukee Electric Crane & Mfg. Co.

General American Tank Car Corporation, Chicago, Ill., three 10-ton electric traveling cranes, 60-ft., 50-ft. and 30-ft. 7-in. spans, from the Milwaukee Electric Crane & Mfg. Co.

American Locomotive Co., a 30-ton trolley for Chester works, from the Shaw Electric Crane Co.

Union Tank Car Co., a 22-ton, eight-wheel locomotive crane from the Orten & Steinbrenner Co. for Lima, Ohio.

Anaconda Copper Mining Co., 25 Broadway, two 10-ton electric traveling cranes from the Shaw Electric Crane Co., cranes for Raritan, N. J.

Richardson Scale Co., Athenia, N. Y., a 35-ton, 44-ft. span, three-motor overhead traveling crane from the Northern Engineering Works.

Semi-Steel Casting Co., St. Louis, a 5-ton, 45-ft. span, two-motor crane for foundry service from the Northern Engineering Works.

Michigan Stove Works, Detroit, Mich., a three-motor, 27-ft. span overhead traveling crane for foundry service from the Northern Engineering Works.

The Tropenas Co., 2243 Nostrand Avenue, Brooklyn, announces that its Rio de Janeiro representatives have been appointed consulting engineers to the Brazilian War Department for service at the Rio de Janeiro war arsenal. This appointment, it is stated, is the outcome of the failure of a European mission to bring about desired results in the revamping operations at the Rio arsenal. Coming closely after the arrival of the United States Naval Mission in Brazil, this appointment, the Tropenas Co. says, shows the esteem in which American army and navy methods are held by its South American neighbor. A program of improvement for the Rio arsenal is now being prepared and considerable American machinery will be purchased. Preliminary requirements include die casting machines to produce threaded zinc bushings for shrapnel fuses; centering machines for 75-mm. cast-iron shells and 75-mm. shrapnels; shell-banding machines; machinery to weld copper bands or produce them from tubing;

complete sets of gages for 75-mm. shells; hydraulic forming presses; heat treating furnaces; diaphragm producing rig; quick bar-cutting machines for 3-in. rounds; small repair plant to handle all automobile repairs, to include machinery to rebore or grind cylinders, carbon burning, etc.; complete plant to produce twist drills and milling cutters. The company requests that three copies of all catalogs of equipment such as is listed above should be sent to its Rio offices addressed as follows: Etienne Roubieu, Tropenas Co., Casa Maua-Sale No. 119, Avenida Rio Branco, No. 9, Rio de Janeiro, Brazil. One copy should also be sent to the company's main offices in Brooklyn.

The Siemund Wenzel Electric Welding Co., Vernon Avenue, Long Island City, has acquired property on Hancock Street totaling 12,500 sq. ft. for a new plant.

A manual training department will be installed in the two and one-half story junior high school to be erected at Hawthorne Avenue and Culver Street, Yonkers, N. Y., estimated to cost $400,000. Chamberlain & Fairbrooke, 18 South Broadway, Yonkers, architects, will call for bids on a general contract in February.

A list of machinery to be installed in the new power plant of the Brooklyn Edison Co., 360 Pearl Street, Brooklyn, to cost close to $5,000,000, includes eight generating units, steam power equipment, air compressors, pumping equipment and auxiliary steam and electrical apparatus for a capacity of 400,000 kw. The plant will be located at the foot of Hudson Street and will cost approximately $10,000,000 complete.

The Knickerbocker Portland Cement Co., 342 Madison Avenue, New York, will build an addition to its plant at Hudson, N. Y., to cost $100,000, including equipment.

The International Paper Co., 30 Broad Street, New York, has secured an option on property on the St. John River, Grand Falls, N. B., and plans the construction of a new hydroelectric power house and paper mill to cost $5,000,000.

Two automobile service and repair buildings, each 100 x 200 ft., estimated to cost more than $175,000, will be constructed by the Yellow Taxicab Co., Inc., Lexington Avenue and Eighty-sixth Street, New York, on property, 200 x 200 ft., recently acquired on East Sixtieth Street, between First Avenue and Avenue A.

The B. F. Goodrich Rubber Co., 1780 Broadway, New York, with main plant at Akron, Ohio, has acquired the plant of the Ames-Holden Tire Co., Kitchener, Ont., for a Canadian branch. Extensions will be made and the plant operated on a basis of 1000 tires per day.

Francis C. O'Dougherty, 650 Bedford Avenue, Brooklyn, operating a boiler works, plans the installation of a new radial drill, pipe threader and other equipment.

The New York Central Railroad Co., Grand Central Terminal, New York, will install a 2000-kw. motor-generator power station at 110th Street and Park Avenue for third-rail train service.

The Manhattan Brass Co., 332 East Twenty-eighth Street, New York, will install additional equipment at its power plant, in connection with extensions and improvements, to cost $25,000.

Burt Harris, 30 Church Street, New York, iron and steel merchant, has organized Burt Harris & Co., Inc., capitalized at $100,000, to manufacture foundry equipment and supplies.

The Bureau of Yards and Docks, Navy Department, Washington, will take bids at once for electric and hand-power elevator equipment for Government institutions at Tupper Lake, N. Y.

A vocational department will be installed in the one and two-story junior high school to be erected at Westfield, N. J., estimated to cost $500,000. Wilder & White, 16 East Forty-first Street, New York, are architects.

H. P. Smith, 360 Atlantic Avenue, Paterson, N. J., is in the market for two portable return tubular boilers, 70 to 150 hp.

A manual training department will be installed in the new high school to be erected at Hightstown, N. J., for which bids on revised plans will be called in February. Bonds for $154,000 have been sold for the erection.

The Tri-City Electric Co., 16 Mechanic Street, Newark, manufacturer of electrical equipment, has leased a five-story building totaling 30,000 sq. ft., and two-story rear structure at 52-56 Lafayette Street for a new plant. G. M. Ellis is president.

A manual training department will be installed in the new high school to be erected at Chestnut Street and Franklin Avenue, Nutley, N. J., estimated to cost $200,000, for which plans will be prepared at once. Richard Booth is president of the Board of Education.

Otto Bernz, 27 Ashland Avenue, Newark, manufacturer of plumbing equipment, has organized the Otto Bernz Co., with capital of $200,000, to manufacture cutlery, knives, etc.

George W. Heath & Co., 208 First Street, Newark, manufacturer of fountain pens, has inquiries out for a Brown & Sharpe automatic screw machine, late serial number, practically new.

The Martin Metals Corporation, Newark, has leased a portion of the four-story building at 115-117 Monroe Street from the Foster Engineering Co. for a new plant to manufacture aluminum and other castings.

A manual training department will be installed in the proposed high school to be erected at Oxford, N. J., estimated to cost $150,000, to replace the building recently destroyed by fire.

New England

BOSTON, Jan. 29.

NOT much, if any, improvement in machine-tool sales was reported in this district the past week. The large amount of prospective business is slow in developing into actual purchases. Some doubt now exists in the trade as to the ability of the New England railroads to finance shop equipment requirements for 1923. The high operating costs this winter, due to unusually heavy snows and to fuel charges, closely following the shopmen's strike of last year, will, it is believed, leave little money for improvements. Large industrial concerns, in at least certain instances, are insisting old machine tools be taken in part payment for new, which has a tendency to slow up action of the market.

Where tools are sold locally for shipment outside, considerable difficulty is experienced in getting railroads to supply cars. New tool prices continue to show strength, makers of bolt cutters and grinding machines being among the latest to advance prices.

Among recent sales are the following: 14-in. x 5 ft. new plain turning lathe, to a Lowell concern; 24-in. lathe, key seater and milling machine, all new, to a Lowell textile interest; 30-in. planer and a 24-in. lathe, both new, to a Boston hardware manufacturer, used tools figuring in this deal; a 2500-lb. new hammer to a textile machinery maker; three used upright drills and a new 34-ton punch press to a local manufacturer; a new small press and a used riveting machine to a central Massachusetts firm; new boring mill and two used heavy duty milling machines, as well as possibly a dozen used minor important machines, to various companies, and a fairly large amount of transmission for a power producer.

The Uxbridge Worsted Co., Uxbridge, Mass., will build a power plant having a boiler rating of 1500 hp. Two 500 kw. turbo generating units will be installed.

The Howard & Bullough's American Machine Co., Pawtucket, R. I. is to add 30,000 sq. ft. of floor space to its No. 1 building and make other improvements.

The Gillette Safety Razor Co., 41 West First Street, South Boston, has made preliminary plans for an eight-story addition.

Bids close this week on a three-story manufacturing unit contemplated by the Standard Electric Time Co., Springfield, Mass.

The Tubular Woven Fabric Co., Pawtucket Avenue, Pawtucket, R. I., is taking bids for a one-story and basement addition, 83 x 100 ft. Perry & Whipple, Hospital Trust Building, Providence, R. I., are architects.

P. A. Sweeney, 246 Essex Street, Salem, Mass., is organizing a company to build and operate a four-story ice-manufacturing and cold storage plant estimated to cost $150,000, including machinery.

A manual training department will be installed in the two-story and basement high school to be erected at Cumberland, R. I., estimated to cost $85,000. Bids will be taken at once on a general contract. John F. O'Malley, 84 Broad Street, Pawtucket, R. I., is architect.

The Confederated Abattoirs Corporation of Connecticut, Danbury, will install a refrigerating and cold storage plant in connection with its meat-packing plant at New Milford, Conn., estimated to cost more than $150,000. H. O. Averill, New Milford, is an official of the company.

A manual training department will be installed in the new high school to be erected at Groton, Conn., estimated to cost $300,000.

Motors and other electrical equipment will be installed in the new four-story printing plant, 50 x 100 ft., to be erected

on Leavenworth Street by the American Republican, Inc., Waterbury, Conn., estimated to cost $150,000.

The Portsmouth Automobile Body Co., Portsmouth, N. H., has plans for a two-story addition, 40 x 100 ft. J. Edward Richardson, 56 Grove Street, Dover, N. H., is architect. T. J. Boyan, general manager.

A manual training department will be installed in the proposed joint high school to be erected at Westford, Mass., by the Boards of Education of Westford and Graniteville, Mass., estimated to cost $125,000.

A manual training department will be installed in the high school to be constructed at Gorham, N. H., estimated to cost $125,000. Charles M. Walker is superintendent of schools.

A vocational department will be installed in the new high school to be erected in Lonsdale, R. I., by the town of Cumberland, bids for which are now being taken. John O'Malley, Pawtucket, R. I., is the architect.

St. Joseph's Cathedral, 140 Farmington Avenue, Hartford, plans the construction of a $350,000 parochial school this spring. A manual training department will be installed.

Philadelphia

PHILADELPHIA, Jan. 29.

A ONE-STORY power house will be erected by the Bes-wick & Clay Co., Twenty-fifth and Callowhill Streets, Philadelphia, in connection with additions to its textile works to cost in excess of $80,000. M. Ward Easby, Inc., 1514 Chestnut Street, is engineer.

The Apex Machine Co., 2801 West Susquehanna Street, Philadelphia, has purchased property, 89 x 159 ft., on Stenton Avenue, as a site for a new plant.

The General Radio Corporation, 1310 Callowhill Street, Philadelphia, is planning for the installation of a number of machine tools, including lathe and drill press.

The Philadelphia Paper Mfg. Co., River Road, Philadelphia, has awarded contract to the J. S. Rogers Co., Drexel Building, for a new plant at Randolph and Willow Streets to cost $225,000. Clarence E. Wunder, 1415 Locust Street, is architect.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, is taking bids on a general contract for a one-story power house addition at Trenton and Somerset Streets. John T. Windrim, Commonwealth Building, is architect. The company is arranging for an increase in capital from $65,000,000 to $100,000,000,a portion of the proceeds to be used for extensions to power plants and system.

A one-story power house will be erected by the Art Loom Rug Co., Mascher and Westmoreland Streets, Philadelphia, to cost approximately $50,000.

The Foreign Trade Bureau, Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry from a company at Java, Dutch East Indies, for small circular saws; also, for small machines for straightening, polishing and trimming rattan and kindred products. A company at Kenya Colony, British East Africa, is in the market for hand-power machines for tin can manufacture; and a concern at Tampico, Mex., has inquired for pumping machinery to handle water from a depth of 24 ft.

The American Meter Co., Seventeenth and Clearfield Streets, Philadelphia, has acquired the three-story building, 20 x 120 ft., at 1523 Race Street, for extensions.

The Reading Rubber Co., Trenton, N. J., Maxwell A. Kraemer, American Mechanic Bank Building, representative, recently organized with a capital of $250,000, now operating a small plant at Kutztown, Pa., is selecting a site at Trenton for the erection of a new plant, estimated to cost $100,000 with machinery, to manufacture automobile tires and tubes.

Guy de la Rigaudiere, president of the Traveler Rubber Co., Bethlehem, Pa., manufacturer of automobile tires, and associates, have organized the United & Globe Rubber Corporation, under Delaware laws, to take over and operate the company of the same name with plant at Prospect and Frazier Streets, Trenton, N. J., to specialize in the production of mechanical rubber products, automobile tires, etc. Extensions and improvements will be made in the present works. Mr. de la Rigaudiere will be president of the new company, and John S. Broughton, head of the former United & Globe organization, chairman of the board. Victor Durand, Jr., and G. J. P. Raub, both of the Traveler company, will be first and second vice-presidents, respectively.

The Reading Hardware Co., Reading, Pa., manufacturer of tools and hardware, is arranging for an increase in capital from $1,700,000 to $3,000,000, a portion of the proceeds to be used for additions, including a main seven-story, brick and concrete factory, 80 x 240 ft., with one-story foundry and machine shop. The Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, is architect.

D. P. Minick, 147 East Queen Street, Chambersburg, Pa., will soon take bids for a three-story cold storage plant and power house, 40 x 115 ft., to cost $75,000. John Crowe, Hartman Building, York, Pa., is architect.

The International Woodenware Co., Inc., Royersford, Pa., recently organized to take over the plant and business of the Household Mfg. Co., manufacturer of metal and wood domestic utensils, is arranging for the removal of the local factory to a new four-story plant at Beyer, Pa., where additional machinery will be installed. A four-acre site has also been secured, and plans are being considered for a one-story addition.

The Hubley Mfg. Co., Elizabeth Avenue and Plum Street, Lancaster, Pa., manufacturer of mechanical and other toys, has acquired property adjoining its factory and plans the erection of a two-story addition.

A manual training department will be installed in the high school to be erected at Broomall, Pa., by the School District of Marple Township, for which bids will soon be called. It will cost about $100,000. Henry L. Reinhold, Jr., 1513 Walnut Street, Philadelphia, is architect.

The Merkle Bobbin Co., Allentown, Pa., manufacturer of textile machine equipment, has purchased property at Sixth and Lehigh Streets, 123 x 202 ft., for the erection of a new three-story plant to cost $50,000. Joseph Merkle and J. M. Kiefer head the company.

The Wilkes-Barre Iron & Wire Works, Inc., Wilkes-Barre, Pa., has plans in progress for enlargements, to include the installation of additional equipment.

The Lehigh Star Bedding Co., 310 Lehigh Street, Allentown, Pa., is arranging for the immediate establishment of an addition to manufacture iron bedsteads. A complete enameling department will be installed. Lewis Denison is president.

A manual training department will be installed in the new high school to be erected at Jenkintown, Pa., estimated to cost $150,000, for which bids on a general contract are being received. Heacock & Hokanson, 1218 Chestnut Street, Philadelphia, are architects.

The Lloyd Mfg. Co., Annville, Pa., recently organized, is arranging for the establishment of a plant to manufacture drop forgings, turnbuckles, etc. It is expected to commence work March 1.

A vocational department will be installed in the two-story and basement high school to be erected at Windber, Pa., estimated to cost $200,000. Henry L. Reinhold, Jr., 1513 Walnut Street, Philadelphia, is architect.

The Acme Woodenware Co., Saylorsburg, near Stroudsburg, Pa., recently organized to manufacture metal and wood household utensils, has acquired the local works of the Keystone Clay Reduction Co., and will remodel the structure.

The Victor Talking Machine Co., Camden, N. J., has engaged Stone & Webster, Inc., to design and build extensions to its plant, costing approximately $1,000,000. The work will consist of two structures, one to be used as a record manufacturing building will be eight stories, about 436 ft. long and from 70 to 90 ft. wide. In addition, at least two stories will be added to the grinding building and perhaps four if the foundation will support them.

Baltimore

BALTIMORE, Jan. 29.

THE Maryland Meter Works, Holliday and Saratoga Streets, Baltimore, plans the erection of a seven-story factory.

The L. E. Jones Wire & Iron Works, 321 North Calvert Street, Baltimore, is planning the erection of an additional story on its three-story plant, with improvements in the existing works, to cost close to $45,000. Frederick E. Beall, 1335 North Gilmore Street, is architect.

The Carolina Steel & Iron Co., Greensboro, N. C., has plans for a one-story addition, 80 x 100 ft., to cost $35,000. A 10-ton electric traveling crane, 50 ft. span, will be installed. J. W. McLennan is secretary and general manager.

The Quartermaster, United States Army, Camp Holabird, Md., will take bids until Feb. 7 for the installation of a complete fuel oil burning system at the camp.

The Chief of Air Service, Room 1050, Munitions Building, Washington, will take bids until Feb. 20 for a quantity of airplane parts and assemblies, Circular 23-109; until Feb. 5 for 600 fuel pump drive assemblies, delivery f.o.b., Fairfield, Ohio, Circular 23-113; and until Feb. 6 for 100 high tension electric switches, Circular 23-121.

The Virginian Railway, Norfolk, Va., has preliminary plans for the electrification of 16 miles of road, to include

power houses, heavy motor equipment and other electrical apparatus, estimated to cost $600,000.

O. C. Bell, Cleveland, Ga., is planning the erection of an electric power plant for light and power service, estimated to cost $50,000. Roberts & Co., Atlanta, Ga., are engineers.

A manual training department will be installed in the two-story high school to be erected at Warrenton, Va., estimated to cost $85,000. Smith & May, Calvert Building, Baltimore, are architects.

The Common Council, Appomattox, Va., has secured a fund of $25,000, the proceeds to be used for the installation of a municipal electric power plant. It will replace a power house recently destroyed by fire.

The Cement Products Mfg. Co., Roanoke, Va., recently organized, has plans for the erection of works to manufacture cement blocks, tile and kindred specialties. A list of machinery will be arranged. E. A. Buchanan, P. O. Box 1172, is secretary and treasurer.

The Hagerstown Lime & Chemical Co., Hagerstown, Md., will take bids until about March 15 for its new plant, to include crushing and pulverizing machinery, mechanical drying equipment, etc. J. S. Myers is president.

The Boyden Co-Ordinating Car Corporation, Keyser Building, Baltimore, has tentative plans for a plant to manufacture a coordinating railroad car truck. The company is operating with a capital of 1,000,000 shares of stock, no par value. George A. Boyden is president.

The Yeager Mfg. Co., Hickory, N. C., recently formed with a capital of $125,000, has awarded contract to H. C. Cline, Hickory, for a two-story plant, 60 x 145 ft., to manufacture furniture, estimated to cost close to $75,000, with machinery, which will be electrically-operated. Mason Yeager is secretary and treasurer.

A manual training department will be installed in the new three-story high school to be erected at Chester, S. C., estimated to cost $125,000. Edwards & Sayward, Atlanta, Ga., are architects.

The Allison-Morrison Sign Co., Twelfth and Grace Streets, Lynchburg, Va., will commence the erection of a new plant in the Fort Hill section for the manufacture of signs, comprising two one-story structures, 60 x 208 ft. and 60 x 140 ft.

James H. Berry, 328 Douthit Street, Greenville, S. C., is in the market for a quantity of steel tubing, 2 in. to 6 in. diameter.

The American Mfg. Co., Martinsville, Va., will soon take bids for a four-story furniture manufacturing plant, with electrically-operated machinery, estimated to cost $350,000, including equipment. A. D. Witte is president.

The City Council, Whiteville, N. C., will receive bids until Feb. 9 for a municipal light and power plant, to include one 90 and one 150 kva. electric generator, direct-connected to uniflow engines, with exciter, three-panel switchboard, two uniflow engines, two 100-hp. high pressure boilers, feed-water heater, pumps, and auxiliary equipment. Alternate bids will also be received for a Diesel engine plant, as well as another alternate for semi-Diesel engine installation, with primary equipment. J. B. McCrary Co., Atlanta, Ga., are engineers. Richard M. Lewis is Mayor.

The Asheville Supply & Foundry Co., Asheville, N. C., has an inquiry out for a 3 to 5-ton hoisting engine, contractors' type, for quick delivery at Asheville.

The Ryan Engineering Co., 20 Arcade Building, Columbia, S. C., is in the market for an engine-generator set, 150 kva., three-phase, 60 cycle.

Pittsburgh

PITTSBURGH, Jan. 29.

BUYING of machine tools in this district still is of moderate proportions. An order a day is considered a good showing and few orders involve more than one tool to a buyer. The most persistent source of business is the National Tube Co., which continues to buy against its requirements for the new tube works at Gary, Ind. Few of the tools are going direct to Gary, most of them being shipped to Lorain, Ohio. New inquiries run more to single tools than to lists.

No price changes have been reported in the past week.

Inquiry for cranes is better than actual business. The Central Tube Co., recently closed for a 7½-ton, 110-ft. span crane with the Alliance Machine Co., and the Standard Underground Cable Co., has placed an order for a 10-ton crane with the Pawling & Harnischfeger Co. A local blast furnace interest is seeking prices on an ore bridge and a number of crane trolleys are wanted. The American Sheet & Tin Plate Co., wants crane trolleys for its Laughlin and Shenango works. Crane builders have made a number of quotations for estimating purposes, but whether formal inquiries result depends upon the success of operating departments in securing appropriations. Crane makers seeking the order for three 125-ton ladle cranes for the Duquesne works, Carnegie Steel Co., report keen competition from the Homestead works in that company. Lively inquiry is reported by makers of steel mill equipment, but sales still are out of proportion to the inquiries. Sales of power equipment have been light in the past week, though the National Tube Co. is understood to have placed the roll drive motors for four lap welding furnaces for its new Gary works.

The D. N. Carlin Co., 127 Denniston Avenue, Pittsburgh, manufacturer of mechanical toys, will commence the erection of an addition to its plant to cost $25,000.

The Pittsburgh Meter Co., East Pittsburgh, is taking bids on a general contract for a five-story and basement plant, 80 x 300 ft., to cost $100,000. B. H. Prack, Keystone Building, is architect and engineer.

The McKenna Brass & Mfg. Co., First Avenue and Ross Street, Pittsburgh, has leased the eight-story building, 31 x 95 ft., at First Avenue and Wood Streets, for extensions. The brass works will be removed to the new location and additional equipment installed for increased capacity. The Ross Street works will be maintained.

The Apollo Steel Co., 940 Penn Avenue, Pittsburgh, is planning for the erection of a new one-story works, 40 x 200 ft., on Warren Avenue, Apollo, Pa., to cost approximately $35,000.

Col. E. H. Williams, Latrobe, Pa., formerly connected with the Valley Mould & Iron Co., Sharpsville, Pa., is organizing a company to build a plant to manufacture ingot molds. The works will cost $65,000.

The Morrison Coal Co., Charleston, W. Va., will install additional mining machinery, cars, motors and other electrical power equipment at its properties at McGraws, W. Va. John Laing is president.

The Paint Creek Mining Co., Collinsdale, W. Va., is planning the construction of a new power house and tipple, to replace the structures recently destroyed by fire.

Motors, conveying apparatus, and other electrical equipment will be installed in the three-story printing plant addition to be erected by the Smith Brothers Co., Inc., 407 Grant Street, Pittsburgh, to cost approximately $85,000. J. M. McCollum, Berger Building, is architect.

The West Penn Power Co., West Penn Building, Pittsburgh, is perfecting plans for the erection of a new hydro-electric generating plant on the Monongahela River, in the Cheat Valley section, W. Va. The initial unit will have a capacity of 50,000 hp., and is estimated to cost $3,500,000.

The Automotive Electric Safety Corporation, North East, Pa., is planning the installation of equipment in a local building to manufacture electrically-operated safety machinery, alarm equipment, etc.

A manual training department will be installed in the new high school to be erected at Ridgway, Pa., estimated to cost $135,000.

Fred M. Blethen, Hazleton, Pa., is inquiring for a belt-driven power roll with a capacity for ¼-in. sheets up to 5 ft. wide and a belt-driven slitting shear (serpentine shear preferred) with capacity up to ¼-in. sheets.

Buffalo

BUFFALO, Jan. 29.

AN ice and cold storage plant will be built by the Netherlands Co., Oswego, N. Y., to cost in excess of $150,000.

A manual training department will be installed in the two-story high school, 200 x 200 ft., to be erected on Pulteney Street, Geneva, N. Y., estimated to cost $300,000, for which bids will be called in February. Wilson Potter, 22 East Seventeenth Street, New York, is architect.

Power, conveying and other equipment will be installed in the sewerage disposal plant to be erected jointly by the Boards of Trustees, Brighton and Pittsford, N. Y., estimated to cost $500,000. W. S. Lozier, 321 Cutler Building, Rochester, N. Y., is architect.

The J. L. Scanlon Co., 950 Ellicott Square, Buffalo, has inquiries out for an electrically-operated locomotive crane, 8-wheel, about 20 to 25-tons capacity.

A manual training department will be installed in the new high school to be erected at Lockport, N. Y., estimated to cost $175,000, for which a site has been purchased on High Street.

The St. Regis Paper Co., Watertown, N. Y., is planning the erection of an addition to its plant at Deferiet, N. Y.,

to be equipped as a pulp grinding mill, estimated to cost $60,000.

The Oswegatchie Paper Co., Gouverneur, N. Y., is planning the installation of new pulp grinding machinery. N. R. Caswell is in charge.

A vocational department will be installed in the new high school to be erected at Niagara Falls, N. Y., to replace a structure recently destroyed by fire, estimated to cost $600,000, for which bids on a general contract are being taken. The Associated Architects, Gannon Street, are in charge.

The Standard Foundry Co., 743 Hertel Avenue, Buffalo, is considering the installation of additional labor-saving devices, etc., to further eliminate unskilled labor, and would like to have manufacturers submit ideas.

Cleveland

CLEVELAND, Jan. 29.

BOTH machine tool manufacturers and dealers report a better volume of live prospects. While no round lot orders were placed the past week, sales of single machines showed a gain over the previous week. The largest inquiry came from the Clayton & Lambert Co., Detroit, for 23 metal-working machines and a few wood-working tools. Detroit automobile manufacturers continue to buy considerable equipment in small lots and much of the activity in other sections is due to the demand from manufacturers affiliated with the automotive industry. Some good orders for automatic machines in lots up to 15 or 20 are in prospect.

Akron tire companies and machine shops allied with the rubber industry are adding equipment for making tire molds and various dies for rubber products. One of the most conspicuous buyers is the Goodyear Tire & Rubber Co., which has purchased a number of machines.

The Kent, Ohio, Board of Education during the week purchased three 11-in. Monarch Junior lathes, a 20-in. milling machine, and a 14-in. wet tool grinder, all motor driven, and several additional motors. The Massillon Board of Education has denied the report that it has issued a good sized list of machine tools and states that the construction of the school for which the machinery may be purchased has not yet been authorized, and that the project is not likely to take definite form for six months.

Some machine tool builders in this territory are figuring with the Durant interests regarding equipment for the plant of the New Process Gear Co., Syracuse, New York, for making axles. It is expected that considerable equipment will be required, but the latest information is that it will probably have some of its small parts made outside, which will eliminate from its requirements several automatic machines. The Standard Car Wheel Co., Cleveland, purchased an axle lathe and a wheel press. New inquiries include one from Japan for a large turret lathe.

The American Steel & Wire Co. is inquiring for a 10-ton crane for its Consolidated works, Cleveland.

The Clayton & Lambert Co., Detroit, has issued the following lists of machine tools, which it expects to purchase shortly:

Eight 16-in. lathes.
Six 16-in. shapers.
One 6-ft. plain radial drill.
One 4-ft. universal radial drill.
One 4-ft. sensitive radial drill.
One 20-in. slotter.
One 16-in. slotter.
One 36-in. open side planer.
One 48-in. x 10 ft. standard planer with three heads.
One 60-in. vertical boring machine.
One 48-in. horizontal milling machine.
One jointer.
One planing machine.
One band saw.

The Wood Products Co., Canton, Ohio, will establish a plant for the manufacture of automobile wheel spokes. A. E. Osborne is manager.

The Daniel Engineering Co., now located in Springfield, Ohio, is reported to be planning the establishment of a plant in Canton, for the manufacture of agricultural implements.

The General Fire Extinguisher Co., Warren, Ohio, will erect an addition, 80 x 200 ft.

The Byron Screw Machine Products Co., Byron, Ohio, is erecting an addition. At the recent annual meeting of stockholders, E. C. Edwards and Harry Collins, Toledo, were added to the board of directors.

The Cleveland Universal Parts Co., Cleveland, has been organized and has purchased the plant of the Peters Machine & Mfg. Co., 7320 Madison Avenue, N.W., which has been in the hands of a receiver for some time. The price is understood to have been about $80,000. The new company will manufacture universal joints and oil pumps for automobiles. J. C. Hipp is president; James J. Smith, vice-president; E. R. Seager, secretary, and H. J. Smith, treasurer.

The Swineford Mfg. Co., Canton, Ohio, manufacturer of agricultural implements and hardware specialties will shortly begin rebuilding its two-story plant recently destroyed by fire.

The Marvel Equipment Co., 8710 Harvard Avenue, Cleveland, plans the erection of two factory buildings for machine shop purposes, at an estimated cost of $40,000.

The Faultless Tire & Rubber Co., Ashland, Ohio, is having plans prepared for a one-story factory, 46 x 136-ft.

Cincinnati

CINCINNATI, Jan. 29.

MACHINE-TOOL manufacturers report business continuing at about the same rate as last week, which on the whole is fairly satisfactory. Indications point to a steady improvement during the next few months and some in the trade believe that by the middle of the year the industry will be able to show an operation of 60 to 70 per cent of capacity. No large orders were placed with manufacturers in this district during the week, buying being of the single tool variety from widely scattered points.

A Cincinnati company received an order for an engine lathe from France, with a prospect that several more will be bought. The Norton Iron Works, Ashland, Ky., has closed on several items for a new machine shop and foundry now under construction. The Chicago, Burlington & Quincy Railroad has also been a purchaser in a small way, and several other railroad deals are on the point of closing. Some machines have also been taken by the automotive industry, and indications are that this will be a prolific source of orders for the next few months.

The Kentucky Fluorspar Co., Marion, Ky., has been organized to take over the lease of the original Delaware company of the same name of fluorspar properties in western Kentucky. The new company is capitalized at $50,000 and will operate the properties on a royalty basis. It is equipping a plant at Marion and is in the market for two 150-hp. return tubular boilers. A. A. Northen is president.

The Ironton Boiler Works, Ironton, Ohio, has moved to its new plant in the eastern part of the town and is now in production. Paul Meehan is general manager.

The first heat was poured in the new foundry of the Ironton Punch & Shear Co., Ironton, Ohio, last week. The company reports a decided improvement in business since the first of the year, and prospects for a good year in the punch and shear departments are steadily increasing.

The Marble Cliffs Quarry Co., Hartman Building, Columbus, Ohio, producer of blast furnace flux and other grades of stone, is making improvements to its works and will shortly install a stone crushing and washing plant. W. H. Hoagland is president.

The Duro Pump & Mfg. Co., Dayton, Ohio, is contemplating the erection of an addition which will enable it to double the present output. C. E. Burnett is president.

The International Derrick & Equipment Co., Columbus, Ohio, manufacturer of galvanized steel oil and gas derrick transmission towers, has completed the installation of an outside crane runway with an 87-ft. crane and contemplates extensions to its plant which will triple its capacity. Gordon Battelle is president.

The Norton Iron Works, Ashland, Ky., recently completed an addition, 150 x 200 ft., and will soon commence the manufacture of wire cloth, 204 looms having been installed. It is now erecting a building, 47 x 200 ft., to house its foundry, machine shop, pattern shop and annealing furnaces. Wire will be drawn down to 34-gage with the installation of a number of wire drawing blocks. Thomas Adams is president.

THE IRON AGE in its issue of Jan. 11, page 202, was in error in stating that H. M. Lloyd, of the Valls Engineering Co., Columbus, Ohio, had formerly been connected with the Alliance Machine Co.

Detroit

DETROIT, Jan. 29.

THE Codde Brass & Aluminum Mfg. Co., Detroit, care of Robert Finn., 622 McKerchey Building, architect, has awarded contract to Alfred R. Yops, 3072 Maybury Avenue, for a new one-story foundry, 50 x 140 ft.

The Atlas Drop Forge Co., Lansing, Mich, has completed plans for a new one-story unit for the production of drop forgings.

The Reynolds Spring Co., Jackson, Mich., manufacturer of automobile springs, has called a special meeting of stockholders Feb. 14 to arrange for the sale of additional common stock to total $882,000, the entire proceeds to be used for extensions, additional equipment, and expansion in working capital. Plans are being drawn for two two-story additions, 130 x 140 ft. and 100 x 130 ft., to cost in excess of $160,000. The Austin Co., 208 South La Salle Street, Chicago, is engineer. W. R. Reynolds is president.

The Miles Machinery Co., Bearinger Building, Saginaw, Mich. is planning to purchase a number of machine tools and other equipment. Wood-working machinery will also be bought.

The Springfield Body Corporation, Springfield, Mass., operating at the former plant of the Smith-Springfield Body Co., has acquired the plant at Pontiac, Mich., previously used by the Friend Motor Car Co., bankrupt, for its Michigan plant. It aggregates 285,000 sq. ft. on a 16-acre tract, and will be remodeled and improved. With its recently acquired works at Bloomfield, N. J., the Springfield company purposes to develop an annual capacity of 15,000 bodies at the three plants.

The Public Lighting Commission, 174 East Atwater Street, Detroit, is completing plans for a municipal power house at the Detroit River and Morrell Street, estimated to cost $250,000.

The Lee Foundry & Machine Co., 420 Mill Street, Plymouth, Mich., has plans for a one-story foundry addition, estimated to cost $35,000. Christian W. Brandt, Kresge Building, Detroit, is architect. H. S. Lee is president.

The Motor Wheel Corporation, Lansing, Mich., has secured the trademark, assets and rights of manufacture of the steel automobile wheels heretofore produced by the Detroit Pressed Steel Corporation, 6660 Mount Elliott Avenue, under the name of Disteel. The purchasing company will continue the manufacture of the wheels in the future, as well as the steel wheels heretofore produced at its Lansing works, and plans for extensions for the combined manufacture.

A manual training department will be installed in the two and three-story junior and senior high school, 170 x 290 ft., to be erected at Lapeer, Mich., estimated to cost $225,000. R. A. LeRoy, Pratt Building, Kalamazoo, Mich., is architect.

The Litcher Electric Co., 41-43 Market Avenue, Grand Rapids, Mich., manufacturer of electrical equipment, is completing plans for the erection of a three-story and basement works, to replace its plant recently destroyed by fire. The J. J. Fernette Engineering Co., 441 Hanseman Building, is engineer.

The D. E. Morand Machinery Co., Detroit, Mich., is inquiring for a used 48-in. x 48-in. x 12-ft. open side planer with three heads.

Milwaukee

MILWAUKEE, Jan. 29.

INCREASED activity, especially in inquiries, features the machine-tool market. Sales the past week were of fair proportions. Unfilled orders at local shops showed a further slight increase, notwithstanding a small increase in production. The general expectancy of an advance in prices in many items about Feb. 1 is partly responsible for the buying activity during the past two or three weeks, but in the main purchases are being made to fill urgent needs, with prices not a considerable factor in stimulating buying in anticipation of later requirements. Automotive shops continue the principal source of milling machine business, but no large lots are appearing and trade is mostly in single machines.

The Algoma, Wis., water and light commission is taking bids for furnishing and installing two 500-gal. centrifugal pumping engines and for a 100,000-gal. steel tank and tower for the municipal waterworks. D. V. Ackerman is superintendent.

The Badger Lumber & Mfg. Co., Oshkosh, Wis., let the general contract to C. R. Meyer & Sons Co., local contractor, for erecting a brick and concrete furniture factory, 130 x 300 ft., costing $100,000, as the first unit of the reconstruction of the plant recently destroyed by fire. The initial investment will be $100,000. New equipment is now being purchased. E. E. Mielius is secretary.

The Wisconsin Truck Co., Madison, Wis., recently incorporated with $25,000 capital stock to manufacture motor trucks, has increased its capital to $150,000 to enlarge the project. The shop which has been established at 18-20 North Charter Street will be doubled in size and additional equipment purchased to fill an order for 500 trucks and other smaller contracts. D. C. Roberts is president and C. W. Keniston, chief engineer.

The La Crosse, Wis., Board of Industrial Education has engaged Otto A. Merman, local architect, to design the proposed new Longfellow vocational institute, for which purpose $200,000 is available. Plans probably will be ready for bidders about March 15. J. B. Funke is president of the board.

The Milwaukee File & Rasp Co., Milwaukee, has been incorporated with a capital stock of $30,000 to manufacture files, rasps and similar tools. The business is being established by the principal owners of the Suelflohn & Seefeld Co., 45 Second Street, wholesaler of iron, steel and other metal products, etc. Henry F., Clarence and George A. Seefeld appear as incorporators.

The Kurz & Root Co., Appleton, Wis., is a new $75,000 corporation organized by W. W. Root, M. Y. Kurz and Perry O. Powell to take over the business established by Mr. Root some time ago to manufacture electrical appliances and mechanical specialties. The factory is to be enlarged and production increased threefold.

The American Carbonic Machinery Co., Wisconsin Rapids, Wis., expects to start work about March 15 on a $35,000 addition and remodeling of its present foundry and machine shop for increased capacity for manufacturing refrigerating systems and units. Equipment will cost about $25,000 additional. Otto E. Roenius is president.

T. H. Field, Rice Lake, Wis., who recently was granted patents on a number of basic designs of units for motor vehicles, intends to build a factory in Rice Lake to put the car into production. Initial models were built under contract with Minneapolis machine shops. The new corporation is being organized with $1,000,000 capital under Delaware laws. The first construction will consist of a machine shop and assembling floor, with a foundry and other buildings to be added later.

The Henry Danischefsky Co., 1484 Humboldt Avenue, Milwaukee, has the contract to build a two-story brick and concrete shop, 41 x 121 ft., on Cherry Street, for the manufacture of springs. Paul O. Kopplin, 1145 Twelfth Street, represents the owners.

The Mullins Body & Tank Co., Milwaukee, has been chartered to manufacture steel tanks and other special equipment for motor trucks. The authorized capital is $100,000. The principal in the enterprise is Clarence J. Mullins, long associated with the Heil Co., Milwaukee. Definite plans will be announced later.

Chicago

CHICAGO, Jan. 29.

MACHINE tool sales in January did not come up to expectations, although they were somewhat better than those of December. Sellers are in an optimistic frame of mind, however, because of the large number of inquiries, principally for single machines, which are coming from a wide variety of miscellaneous users. At the same time some of the larger buyers continue to figure in the market. Among them, the Studebaker Corporation, the Nash Motors Co., the Continental Motors Co. and the International Harvester Co. continue to place orders for a few machines from time to time. The Chicago, Burlington & Quincy has placed a number of machines left over from its general inquiry and its Eola scrap yard list. The Chicago, Milwaukee & St. Paul is about to close for a large boring mill and slab miller.

General advances in machine tool prices do not now appear to be imminent. The only change reported is an advance of about 10 per cent in guide bar grinding machines by the Diamond Machine Co., Providence, R. I.

The Atchison, Topeka & Santa Fe is inquiring for the following tools:

One 16-in. x 8-ft. engine lathe, South Bend or equivalent.

One 14-in. heavy duty slotting machine with longitudinal and cross feed and feed to circular table.

Two Baker or Colburn, or equivalent, vertical high-power 24-in. drilling machines with compound table and capacity to drill 4-in. hole in steel.

One 4-ft. plain heavy duty type motor-driven radial drill.

The Missouri Pacific is expected to place orders against its pending list of 53 items this week. The Omaha, Neb., Board of Education has issued an inquiry for 30 motor-driven tools for a new technical high school.

The Illinois Wire & Cable Co., Sycamore, Ill., is in the market for a new or second-hand gap lathe.

The Capital Machine Co., manufacturer of veneer machinery, Indianapolis, Ind., is asking for quotations on a 30-in. x 30-in. x 12-ft. planer.

The Whiting Corporation, Harvey, Ill., has taken the following orders for cranes and foundry equipment: One 10-ton 60-ft. span electric traveling crane for the Pacific Car & Foundry Co., Portland, Ore.; one 10-ton electric traveling crane for Joseph T. Ryerson & Son, Chicago; one 40-ton hand-power crane for the Koppers Co., Pittsburgh; one 10-ton hand-power crane for Yale University, New Haven, Conn.; six 60-in. cupolas, 100 ft. in height, for the Ford Motor Co., Detroit; one 120-in. cupola ordered by Frank D. Chase, Inc., engineer, Chicago, for the new Pullman Co. foundry, Pullman, Ill.; two 84-in. cupolas for the Newcomerstown, Ohio, plant of James B. Clow & Sons, Chicago; one 66-in. cupola and two 42 x 72-in. tumblers for the Birmingham Machine & Foundry Co., Birmingham, Ala.; one 42 x 60-in. tumbler for Fairbanks, Morse & Co., Beloit, Wis.

A. Finkl & Sons Co., 1326 Cortland Street, Chicago, has purchased approximately 100,000 sq. ft. of property adjacent to its present plant and will start immediately with the erection of a forge plant to meet the increased demand for its forged and heat-treated die blocks and piston rods. The present plant will be operated as heretofore and will manufacture alloy and plain carbon steel forgings of a more miscellaneous nature, in any state of finish up to and including approximately 20,000 lb.

The Burnside Steel Co., 1300 East Ninety-second Street, Chicago, has let contracts for a one-story foundry building, 60 x 124 ft., at 9157 South Kimbark Avenue, to cost $15,000.

The Delta Star Electric Co., 2437 Fulton Street, Chicago, has let a contract for a one-story plant, 103 x 109 ft., for the manufacture of high tension electrical products, to cost $40,000.

The Bates Expanded Steel Truss Co., East Chicago, Ind., has completed plans for a new galvanized steel post plant to cost $100,000. The building will be erected on a site adjoining the present factory and work will be started early in the spring.

Fire of undetermined origin recently caused a loss of approximately $20,000 at the plant of the Wabash Foundry Co., Wabash, Ind.

The Central Illinois Public Service Co. will build an ice manufacturing plant at Charleston, Ill., to cost $90,000.

The Indiana Electric Corporation has started the construction of a power plant on the banks of the Wabash River, seven miles south of Terre Haute, Ind. It will cost $6,000,000.

The Wolverine Carton Co., recently incorporated with $300,000 worth of preferred stock and 30,000 shares of no par common stock, has taken over the plant of the Loraine Motor Co., Wyoming, Mich., and will use it for the manufacture of folding paper boxes and cartons. From 100 to 150 people will be employed. Officers include Thomas V. Speed, president; Walter A. Mockler, vice-president, and C. U. Clark, secretary-treasurer.

The P. and C. Nut Co., Jackson, Mich., has let the contract for a new factory to be built on South Park Avenue near the American Gear & Mfg. Co. plant.

The Apex Smelting Co., recently incorporated, has leased property at 2554 West Fillmore Street, Chicago, consisting of 10,000 sq. ft. of foundry space, 5000 sq. ft. of storage space in a separate building, and an office and laboratory. A spur from the Baltimore & Ohio Chicago Terminal serves the loading platform of the foundry. The company will smelt and refine aluminum and white metal alloys and in addition to manufacturing will do a jobbing business in most grades of non-ferrous metals. Equipment consists of specially built aluminum rotating melting furnaces and grating furnaces and kettles for the manufacture of white metals. In addition, the plant will have a crane and conveyor system for handling and pouring metals into molds. W. A. Singer, secretary and treasurer, was formerly with the U. S. Reduction Co., East Chicago, Ind.

The Rockford Cabinet Co., Twelfth Street and Ninth Avenue, Rockford, Ill., has plans for two four-story additions averaging 80 x 160 ft., estimated to cost $250,000, including machinery. Peterson & Johnson, Swedish-American National Bank Building, are architects.

The Grigsbey Mfg. Co., Chicago, manufacturer of automobile equipment and accessories, has leased 5000 sq. ft. in the building at 628-30 West Jackson Boulevard for a new plant.

The Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, is considering plans for extensions in its car and locomotive shops at Salem, Ill., to cost $250,000 with machinery.

A vocational department will be installed in the two-story and basement central high school, 90 x 310 ft., to be erected on West Fifth Street, Grand Island, Neb., estimated to cost $350,000. Kirsche & Crocker, Ryan Building, are architects.

A vocational department will be installed in the two-story high school, 140 x 200 ft., to be erected at Waseca, Minn., estimated to cost $275,000. William B. Ittner, Board of Education Building, St. Louis, is architect.

The Common Council, Nebraska City, Neb., is planning for extensions and improvements in the municipal power plant, including the reconstruction of a portion of the station, estimated to cost $75,000.

The Great Northern Railroad Co., Railroad Building, St. Paul, Minn., is completing plans for a one-story car repair shop at St. Cloud, Minn., 145 x 345 ft., estimated to cost $200,000 with machinery. A. H. Hogeland is chief engineer.

A manual training department will be installed in the proposed three-story East junior high school to be erected on Charles Street, Rockford, Ill., estimated to cost $750,000. Peterson & Johnson, Swedish-American National Bank Building, are architects.

The New Trier Township High School Board, Edward J. Phelps, president, 505 South La Salle Street, Kenilworth, Ill., has plans in preparation for a manual training school unit and power house at Winnetka, Ill., to cost $200,000. Perkins, Fellows & Hamilton, 814 Tower Court, Chicago, are architects.

The Gulf States

BIRMINGHAM, Jan. 30.

THE Fort Worth Elevator Co., Fort Worth, Tex., manufacturer of elevators and parts, has awarded contract to Butcher & Sweeney, Fort Worth, for a new two-story building, 120 x 200 ft., estimated to cost $90,000. W. G. Clarkson, First National Bank Building, is architect.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until Feb. 21 for an ice-manufacturing and refrigerating plant for installation at the United States Veterans' Hospital, Gulfport, Miss., including motor-driven compressors, condensers and other machinery as set forth in Specification 4780.

Fire, Jan. 20, destroyed the saw mills and other woodworking mills of the Finkbine Lumber Co., Wiggins, Miss., with loss estimated at $500,000, including power house and machinery. It is planned to rebuild.

The Chickasha Cotton Oil Co., Chickasha, Okla., has tentative plans under consideration for the erection of a new plant at Stamford, Tex., estimated to cost $150,000, including machinery. A power house will also be erected.

Samuel W. Kendall, Meridian, Miss., is organizing a company to build a cement manufacturing plant on the Kelley quarry property at Sheffield, Ala. The initial unit will have a capacity of 2000 bbl. per day, and will be supplemented by another unit of like size at an early date. Other structures will include a power house and machine shop. The plant is estimated to cost $1,000,000, with machinery.

The State Board of Education, Montgomery, Ala., is planning for the erection of an addition to the State School of Trades and Industries for Boys, Ragland, Ala., to cost approximately $75,000. Dr. John W. Abercrombie is superintendent.

A manual training department will be installed in the new two-story and basement high school to be erected at Albany, Ala., estimated to cost $200,000, for which ground will be broken at once. William B. Ittner, Board of Education Building, St. Louis, is architect.

The Arctic Pure Ice Co., New Orleans, is considering plans for a new one-story ice-manufacturing plant at Cortez and Bienville Streets. All equipment will be electrically-operated. G. H. Rathe is president.

The Lone Star Roofing Co., Houston, Tex., recently organized by V. M. Duke, local manager for the Barrett Co., Inc., Philadelphia, and associates, has acquired the building heretofore operated by the Peden Iron & Steel Co. and will establish a plant for the manufacture of roofing products.

The Texas & Pacific Railroad Co., Houston, Tex., will install new machine tools and other equipment at its car and locomotive shops at Marshall, Tex., to cost about $150,000.

A vocational department will be installed in the three-story junior high school to be erected at Vicksburg, Miss., estimated to cost $225,000. W. A. Stanton, Vicksburg, is architect.

The Valley Electric & Ice Co., Brownsville, Tex., recently organized as a subsidiary of the Central Power & Light Co., will take over a number of properties in this district, including the Pharr Ice, Light & Power Co., the Donna Light & Ice Co., the Rio Grande Ice Co., and the Mercedes Electric & Water Co. Plans are under consideration for extensions in the ice-manufacturing and refrigerating plants and some of the electric power plants. R. W. Morrison is president.

The R. G. Holzer Estate, Burgundy Street, New Orleans, is planning for the installation of tools at its machine works, including a horizontal tapping machine, punch shear and rod cutter, and other equipment.

A manual training department will be installed in the new junior high school to be erected on Pruitt Avenue, San Antonio, Tex., to cost $175,000, for which bids on a general contract are being received until Feb. 6. Phelps & DeWees, San Antonio, are architects.

D. & B. Pump & Supply Co., Los Angeles, Calif., has purchased land and buildings at the Aviation Repair Depot at Love Field, Dallas, and will establish a factory for the manufacture of oil well pumps.

Indiana

INDIANAPOLIS, Jan. 29.

THE Chalfant Can Co., 1965 South Meridian Street, Indianapolis, is considering the erection of a one and two-story plant in the vicinity of Fort Wayne, Ind., estimated to cost $55,000. L. A. Corcoran is president.

The Millspaugh & Irish Corporation, Indianapolis, has been organized with a capital of $1,500,000 to take over the company operated as Millspaugh & Irish, manufacturer of automobile bodies, with plant on LaSalle Street. The new company contemplates extensions and proposes to issue preferred stock for $425,000 and common stock for $106,250, a portion of the proceeds to be used for such purpose. Harry B. Millspaugh is president, and Clarence R. Irish, vice-president and general manager.

The Vigo Mining Co., Ross Dispensary Building, Sullivan, Ind., has plans for a new one-story power house, 55 x 80 ft., to cost $85,000. The Shourds-Stoner Co., Tribune Building, Terre Haute, Ind., are architects.

The City Council, Fort Wayne, Ind., is planning for extensions and improvements in the municipal power plant and system to cost approximately $150,000, including equipment.

A manual training department will be installed in the high school to be erected at Delphi, Ind., estimated to cost $250,000. Preliminary plans are being drawn by Elmer E. Dunlap, State Life Building, Indianapolis, architect.

A manual training department will be installed in the two-story and basement Franklin junior high school to be erected at Logansport, Ind., estimated to cost $250,000, for which bids have been taken on a general contract. Allen & Garriott, Masonic Temple, are architects.

Plans are in progress for a one-story power house at the James Whitcomb Riley Memorial Hospital, Indianapolis. The same power plant will be used for service at the Indiana University School of Medicine and the Robert W. Long Hospital. It is expected to cost $275,000.

Motors, controllers and other equipment will be installed in the new one-story printing plant, 250 x 465 ft., to be erected at Crawfordsville, Ind., by the R. R. Donnelley & Sons Co., 731 Plymouth Court, Chicago, estimated to cost $500,000 with machinery. Howard Shaw, 39 South State Street, Chicago, is architect.

The Stout Furniture Co., Brazil, Ind., plans the erection of an addition to cost approximately $70,000. It will be three-stories and basement.

The Central South

ST. LOUIS, Jan. 29.

W. B. BURGESS, 1320 Marcus Street, St. Louis, operating a plant for the manufacture of screens, wire goods, etc., has organized the W. B. Burgess Screen Co., with capital of $30,000, to take over the present works. Extensions and improvements will be made. The company will be headed by W. B. and N. A. Burgess.

The Pine Bluff Refining Co., Pine Bluff, Ark., will build an addition to its refinery to cost $100,000, including machinery. New pressure stills and other equipment will be installed.

The Evans-Thwing Refining Co., 624 Finance Building, Kansas City Mo., is completing plans for a new oil refinery at El Dorado, Ark., estimated to cost $500,000, including equipment. The work will include a power house.

The Memphis Power & Light Co., Memphis, Tenn., is completing negotiations for the purchase of the power plant of the Memphis Street Railway Co., and will build an addition to increase the capacity about 15,000 kw. To carry out the work, a portion of a bond issue of $5,500,000, now being sold, will be used for this purpose. T. H. Tutweiler is president.

The Casey-Hedges Co., Chattanooga, Tenn., manufacturer of boilers, tanks, etc., will commence the erection of a new one-story plant on Whiteside Street, 150 x 150 ft., to be used primarily for the production of range boilers, with initial capacity of 500 daily. It is estimated to cost $175,000, with machinery.

The Pidgeon-Thomas Iron Co., 94 Second Street, Memphis, Tenn., will soon take bids for a new two-story and basement building, 150 x 350 ft., estimated to cost $85,000.

Leonard Boyd, city clerk, Pittsburg, Kan., will take bids until Feb. 7 for one 750 gal. per min. and two 1000 gal. per min. motor-driven centrifugal pumping engines, with control equipment, screens, etc., for a new municipal pumping plant. Black & Beatch, Mutual Building, Kansas City, Mo., are engineers.

The Bert Johnson Orchards, Inc., Highland, Ark., is planning the construction of a new one-story power house, to replace a structure recently destroyed by fire.

The Phillips-Morgan Estates Corporation, 607 Ridge Building, Kansas City, Mo., will commence the erection of a new paper manufacturing plant, consisting of two one-story mills, each 50 x 220 ft., estimated to cost $80,000. L. L. Morgan is president.

A manual training department will be installed in the proposed high school to be erected at Gilman City, Mo., estimated to cost $85,000. I. O. Oliphant is secretary of the school board.

plant, lately destroyed by fire. The new structure will be one-story, 90 x 100 ft. A list of equipment to be installed will include shears, punches, transmission machinery, bench tools and kindred apparatus.

A manual training department will be installed in the high school to be erected at Pleasant Hill, Mo., estimated to cost $125,000. W. H. Saylor & Co., 306 Mutual Building, Kansas City, Mo., are architects.

The New State Ice Co., Oklahoma City, Okla., will commence the erection of a new one-story ice-manufacturing plant, 125 x 130 ft., to cost $50,000. Ophuls & Hill, 112 West Forty-second Street, New York, are engineers. Carl Glitsch is general manager.

The Kansas Electric Power Co., Emporia, Kan., will build a one-story addition to its electric power plant for the installation of additional equipment. Improvements will also be made in the present generating plant. Horner & Wyatt, 306 McMillen Building, Kansas City, Mo., are engineers.

A vocational department will be installed in the new Liberty Memorial high school, Lawrence, Kan., three-stories, 120 x 210 ft., estimated to cost $475,000. Work has commenced and equipment bids will soon be called. W. B. Ittner, Board of Education Building, St. Louis, is architect.

The Brooks Burner Stove Co., Ardmore, Okla., manufacturer of gas ranges, etc., is arranging to rebuild its

The Superior Folding Box Co., 1213-15 Chestnut Street, St. Louis, has completed plans for the erection of a three-story factory, 130 x 160 ft., at Penrose and Geraldine Streets, for the manufacture of paper boxes and containers, to cost $75,000. Leonard Haeger, 3844-A Utah Place, is architect.

The Golden Rule Refining Co., Wichita, Kan., has acquired about 7 acres at Tonkawa, Okla., as a site for a new oil refinery, to cost close to $100,000, with machinery.

The Pacific Coast

SAN FRANCISCO, Jan. 29.

THE Standard Tool & Supply Co., Los Angeles, recently organized, has acquired three acres in the Dominguez section as a site for a new plant to manufacture a line of oil drilling tools. Two machine shops will be built, one to be used primarily for repair work.

The San Joaquin Light & Power Corporation, Fresno, Cal., will commence the erection of a new power house at California and Orange Avenues, to cost about $105,000. It is also planning the construction of a hydroelectric generating plant on the Kings River, about 50 miles from Fresno, estimated to cost $10,000,000.

The Tulare Farm Bureau, Visalia, Cal., is formulating plans for a new central ice-manufacturing and cold storage plant to cost $75,000.

The Bay Point Box & Mfg. Co., Martinez, Cal., has tentative plans for rebuilding the portion of its plant destroyed by fire Jan. 18, with loss estimated at $80,000, including machinery.

The Southern Pacific Railroad Co., 65 Market Street, San Francisco, will build an electric generating plant in connection with its car and locomotive shops, and freight terminals on the San Fernando Road, Los Angeles. The entire project will involve more than $1,000,000. Plans are being prepared.

A manual training department will be installed in the two-story high school, 180 x 260 ft., to be erected at Sedro-Woolley, Wash., estimated to cost $200,000.

The Columbia Cement Co., Concord Building, Portland, Ore., is planning the erection of a new plant in the vicinity of Huntington, Ore., to cost in excess of $750,000, with machinery. The company is operating with a capital of $2,000,000.

The Placentia Orange Growers' Association, Fullerton, Calif., is perfecting plans for the construction of a new ice-manufacturing, refrigerating and precooling plant to cost $175,000, with machinery. E. D. Lang is president, and George Welton, treasurer.

The Pacific Power & Light Co., Portland, Ore., has disposed of a preferred stock issue of $1,215,000, a portion of the proceeds to be used for extensions and improvements, including a hydroelectric generating plant.

The Angeles Foundry Co., Port Angeles, Wash., will expand its facilities through the erection of a new foundry, 50 x 90 ft. A five-ton crane and a new brass furnace will be added and a larger cupola will be installed.

Canada

TORONTO, Jan. 29.

WHILE the machine-tool business is fairly good, it has not yet reached the activity expected but the outlook for the next six months is exceptionally bright, with a large volume of unplaced business in sight. The automotive industry is making good strides for increased production, and construction has already started on a number of new plants in Ontario. The Canadian National Railways is still entering the market for equipment, but chiefly in units of two or three. For practically all lines of equipment dealers report improved demand over that of a month ago. Small tools are also showing more activity.

The Toronto Transportation Commission, Toronto, has awarded the general contract to the John V. Gray Construction Co. for repair and erecting shops to be built at the corner of Davenport Road and Bathurst Street. The plant will consist of a main building, 452 x 466 ft.; general stores building, 116 x 300 ft., and shipping room, 23 x 116 ft., and when completed will represent an expenditure of approximately $2,000,000. Equipment for the boiler room, 45 x 86 ft., has been ordered and the list of requirements for the machine shop is being prepared by Mr. McRae, superintendent of rolling stock. The Toronto Transportation Commission has purchased considerable new equipment since taking over the system from the Toronto Railway Co., and it is stated that the greater part of the wood-working equipment will be moved to the new shops and about 80 per cent of the present machine tools will be available for the new plant. The requirements for the new works will include several new lathes.

The Frost Steel & Wire Co., Hamilton, Ont., has taken over the business of the Banwell-Hoxie Wire Fence Co. The properties adjoin and the transaction will make available property for proposed expansion. For the present the two plants will be operated separately, both in producing and selling. The Banwell-Hoxie plant will continue under the management of Frank Walker. In the future, however, the Frost Steel & Wire Co., which draws its own wire, will supply the new plant, whose supplies were formerly imported. In addition to the production of fence wire the Frost company makes telephone and all kinds of commercial wire and has an annual output of 20,000 tons.

Hollingsworth & Whitney, St. Stephen, N. B., will start work in the spring on the erection of a paper mill. It also proposes to erect a sawmill.

The Grand Lake Coal & Railway Co., Ltd., headed by Sir Thomas Tait, Montreal, is contemplating spending about $500,000 on machinery and equipment for coal development work at Minto, N. B.

The machine shop in connection with the drydock of the St. John Dry Dock & Shipbuilding Co., Ltd., Courtney Bay, St. John, N. B., has been completed and it is now the intention of the company to start work immediately on the erection of a foundry.

It is reported that a syndicate of New Brunswick business men has purchased the site of the Everett & Wilson foundries, owned by the Turnbull Real Estate Co., and that a new foundry will be built in the spring.

The Bridge River Power Co. proposes hydroelectric development, amounting to about 400,000 hp., a short distance from Seton Lake, Lillooet, B. C. Power to be generated will augment the Vancouver Power Co.'s plants at Coquitlam and Stave Lake, B. C., and will be used for the city of Vancouver.

The Municipal Council of North Bay, Ont., will purchase a new gasoline engine with pumps capable of handling 1800 gal. of water per min., to be installed in the municipal pumping station, at a cost of $7,581.

STEEL AND INDUSTRIAL STOCKS

Anxious Watching Continues While European Conditions Are Uncertain

A mood of relentless anxious watching pervades the market in steel and industrial stocks. Compared with the general market, these issues evinced more of a firmness last week, quickened now and then by optimistic statements by Presidents Grace and Topping. Trading has tapered down to a narrow range and every move is marked by careful scrutiny. It is observed that steel stocks are less vulnerable under the stress which professional traders seek to fix on each new turn in the European tangle. Factors in domestic trade play the larger part; but it goes without saying that a genuine turn for the better in the Ruhr deadlock would send stocks decidedly up.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalm.	45¾	46⅝	Harbisen Walker..	115	..
Allis-Chalm. pf....	97½	..	Inland Steel.....	46	48
Am. B. S. & Fdry.	74	75¾	Int. Har.....	89	90
Am. B. S. & F. pf.	108	108½	Int. Har. pf.....	115	..
American Can	80½	83⅝	Lima Loco.....	59	62
American Can pf..	112	112½	Midvale Steel.....	27⅜	28⅞
Am. Car & Fdry..	178¾	179⅞	Nat.-Acme	11⅛	11⅜
Am. Car & F. pf..	125	125⅞	Nat. E. & Stm....	66⅝	67¾
Am. Locomotive..	120⅝	123½	N. Y. Air Brake..	28	..
Am. Locomot'e pf.	121	121½	Nova Scotia Steel.	27	27½
Am. Radiator.....	79	80¼	Otis Steel.....	8	8½
Am. Steel Fdries..	35⅝	36¼	Otis Steel pf.....	47	49
Am. Steel Fdr. pf.	102	103½	Pressed Stl. Car..	65	66⅝
Baldwin Loco.....	131⅛	134⅝	Pressed Steel pf..	86	92
Baldwin Loco. pf.	113	..	Ry. Steel Spring..	112⅛	113½
Bethlehem Steel..	59½	62½	Replogle Steel.....	26¼	27¼
Beth. Stl. Cl. B...	61¼	63¼	Republic	47⅝	49¼
Beth. Stl. 8% pf..	107⅞	108¼	Republic pf.....	89	92¾
Brier Hill.....	19	19¼	Sloss	45	49
Br. Em. S. 1st pf..	67	..	Sloss pf.....	82	..
Br. Em. S. 2d pf..	24¾	..	Steel of Canada...	61½	62¾
Cambria Steel.....	41	44	Superior Steel....	30¼	32
Chic. Pneu. Tool..	84¼	87¼	Un. Alloy Steel...	34	..
Colorado Fuel.....	25⅜	..	U. S. Pipe.....	30	31¾
Crucible Steel.....	70⅝	74⅞	U. S. Pipe pf.....	69	71
Crucible Steel pf..	91½	..	U. S. Steel.....	105	106⅝
Deere, pf.....	74	74½	U. S. Steel pf.....	121¼	122⅝
General Electric..	180⅝	183⅝	Vanadium Steel ..	25¼	36⅜
Gt. No. Ore Cert..	30	30⅜	Va. I. C. & Coke..	54½	..
Gulf States Steel..	80½	84¾	W'house Air Br...	107	109⅜

Republic Bonds Sold

Republic Iron & Steel Co. $10,000,000 refunding and general mortgage sinking fund 30-year 5½ per cent gold bonds, series A, offered by Kuhn, Loeb & Co. last Friday, were entirely sold by the next evening. The issue was proposed to reimburse the company in part for capital expenditures already made. The company has decided on a construction program, to be completed by Jan. 1, 1924, which will increase production and it is estimated will raise earnings about $1,500,000 per year. Application was made to list the issue on the New York Stock Exchange.

President John A. Topping said in connection with the new financing:

"The only year during the company's existence when interest charges were not earned was 1921, when, owing to the general collapse in business, a net loss after interest of $5,665,000 occurred. The year 1922 was also one of abnormal conditions, owing to the coal and railroad strikes, but notwithstanding these conditions, earnings for the year were nearly double the interest requirement on bonds then outstanding, while earnings for the past quarter were at the rate of over four times interest requirements on bonds outstanding and those to be presently issued."

Annual earnings, applicable to the payment of interest on bonds, as shown in the company's annual reports, after taxes and charges, during the 10-year period ended Dec. 31, 1921, have averaged $6,044,407, or five times the interest charges on bonds now outstanding and presently issued.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.19c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.19c.
Hoops, base price	5.04c.
Bands, base price	3.99c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.29c.
Channels, angles and tees under 3 in. x ¼ in., base	3.19c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.20c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.40c.
Toe-calk, ½ x ⅜ in. and larger	4.15c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.25c.
Open-hearth spring steel	4.00c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.90c. to 4.05c.
Squares, flats and hex	4.40c. to 4.55c.
Standard cast steel, base price	15.00c.
Extra cast steel	18.00c.
Special cast steel	23.00c.

Tank Plates—Steel

¼ in. and heavier	3.29c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.19c.
No. 12	4.24c.
No. 14	4.29c.
No. 16	4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass. Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.15c. to 4.30c.	.....
Nos. 22 and 24	4.20c. to 4.35c.	4.60c.
No. 26	4.25c. to 4.40c.	4.65c.
No. 28	4.35c. to 4.50c.	4.75c.
No. 30	4.60c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.50c. to 4.75c.
Nos. 18 and 20	4.65c. to 4.90c.
Nos. 22 and 24	4.80c. to 5.05c.
No. 26	4.95c. to 5.20c.
No. 27	5.10c. to 5.35c.
No. 28	5.25c. to 5.50c.
No. 30	5.75c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt	—50	—35	½ in. Butt	— 4	+19
¾ in. Butt	—55	—42	¾ in. Butt	—11	+ 9
1-3 in. Butt	—57	—44	1-1½ in. Butt	—14	+ 6
2½-6 in. Lap	—54	—41	2 in. Lap	— 5	+14
7-8 in. Lap	—50	—26	2½-6 in. Lap	— 9	+ 9
9-12 in. Lap	—46	—25	7-12 in. Lap	— 3	+16

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.75c. to 5.00c.
Annealed soft	4.75c. to 5.00c.
Galvanized annealed	5.40c. to 5.65c.
Coppered basic	5.40c. to 5.65c.
Tinned soft Bessemer	6.40c. to 6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	20 c. to 21 c.
High brass wire	20½c. to 21½c.
Brass rods	17¼c. to 18¼c.
Brass tube, brazed	27 c. to 28 c.
Brass tube, seamless	23½c. to 24 c.
Copper tube, seamless	26½c. to 26¾c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22½c. to 23½c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb, advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Primes	Wasters
			80 lb.	$5.80	$5.55
			90 lb.	5.90	5.65
			100 lb.	6.00	5.75
IC	$10.00	$8.50	IC	6.15	5.90
IX	11.50	10.00	IX	7.15	6.90
IXX	13.00	11.25	IXX	8.15	7.90
IXXX	14.25	12.50	IXXX	9.15	8.90
IXXXX	16.00	14.00	IXXXX	10.15	9.90

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits pig	42c.
Bar	50c. to 55c.

Copper

Lake ingot	16 c.
Electrolytic	15¾c.
Casting	15½c.

Spelter and Sheet Zinc

Western spelter	8½c.
Sheet zinc, No. 9 base, casks	10¼c. open 10¾c.

Lead and Solder*

American pig lead	8¾c. to 9½c.
Bar lead	12c. to 14c.
Solder, ½ and ½ guaranteed	29c.
No. 1 solder	27½c.
Refined solder	24½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	7¾c. to 8¾c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	27c. to 28c.

Old Metals

Prices show little change but the market generally is firm. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.50
Copper, heavy wire	12.00
Copper, light and bottoms	10.00
Brass, heavy	7.00
Brass, light	6.00
Heavy machine composition	9.50
No. 1 yellow brass turnings	7.00
No. 1 red brass or composition turnings	8.75
Lead, heavy	6.00
Lead, tea	4.50
Zinc	4.50